The JOURNAL OF HIGHER EDUCATION

NOVEMBER
1931

VOLUME II
NUMBER 8

THE JOURNAL OF HIGHER EDUCATION is published to serve as the professional journal of the sixty-seven thousand instructors and administrative officers in the colleges, universities, and professional schools of the United States. Among the associate editors there are representatives from every department of academic responsibility in higher education. With their assistance the editorial staff seeks nine times a year to bring to its constituency reports of the most significant investigations in the instructional, administrative, personnel, and curricular problems in all branches of higher education.

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··ıı CONTENTS ıı··

THE COLLECTION AND CREATION OF KNOWLEDGE — S. R. WILLIAMS — 415

From the Fayerweather Laboratory of Physics, Amherst College, Mr. Williams writes his description of the use of the problem method with college students.

A HAZARD TO RESEARCH — CHARLES HARVEY BROWN — 420

The extraordinary increase in the subscription rates of foreign scientific publications has led Mr. Brown, of Iowa State College Library, to make the pertinent comparisons here described.

PARADOXICAL TRENDS — HAROLD RYPINS — 427

The Secretary of the State Board of Medical Examinations, New York State Education Department, Dr. Harold Rypins, finds a paradox in the fact that enrollments in professional schools have increased remarkably in recent years despite the raising of standards of admission.

GRADUATE WORK IN LAND-GRANT INSTITUTIONS — R. E. BUCHANAN — 433

The summary of the "Survey of Land-Grant Colleges and Universities" is here continued by Dean Buchanan, of the Graduate College of Iowa State College. This fourth article in the series is more than a résumé, for the writer has presented his facts with discrimination and judgment.

FINANCIAL STEWARDSHIP — EDWARD A. FITZPATRICK — 441

The need of a sense of stewardship in handling the funds of many Catholic colleges is here discussed by Edward A. Fitzpatrick, President of Mount Mary College, and Dean of the Graduate School, Marquette University. He commends the practice of regular reports, and he suggests the advisability of an administrative board of laymen.

[*Continued on Next Page*]

CONTENTS *(Continued)*

SENIORS AS COUNSELORS — J. E. WALTERS — 446

Seniors have proved to be effective personnel officers in an experiment carried on at the School of Mechanical Engineering, Purdue University. The purpose of this experiment according to Mr. Walters, director of personnel, was to improve the unsatisfactory scholarship records of certain Freshmen.

A SUGGESTED REPORT FORM — ALONZO G. GRACE — 448

Alonzo G. Grace, who has recently gone to the University of Rochester as Assistant Director of Extension Work, here proposes a scheme of marking which in his opinion may be adapted to any course.

WITH THE TECHNICIANS — 451

The colleges and vocations; improvement of college teaching; philanthropy in higher education; young matriculants; geographic distribution of the student body; accomplishment of students; depressions and college fees; foreign students and immigration regulations.

THE REPORTER — 457

The Liberal Arts College Movement's radio program; American and European education contrasted by President Neilson of Smith; Northwestern and a new plan of alumni education; student loan funds to the rescue; leisure-time activities and education; the National Advisory Council on Radio in Education enters the broadcasting field.

EDITORIAL COMMENTS — W. H. COWLEY — 464

REVIEWS — 468

"Creative Mind," by C. Spearman; "The Education of the Whole Man," by L. P. Jacks; "The Measurement of Man," by J. A. Harris, C. M. Jackson, D. G. Paterson, and R. E. Scammon; "Which College?" by Rita S. Halle; "The American College Girl," by Ten American College Girls; "World Workers' Educational Movements: Their Social Significance," by Marius Hansome; "The American Road to Culture: A Social Interpretation of Education in the United States," by George S. Counts; "The Educational Work of Thomas Jefferson," by Roy J. Honeywell.

IN THE LAY MAGAZINES — FRANCES KIRKPATRICK — v

The JOURNAL OF HIGHER EDUCATION is published monthly, except during July, August, and September, by the Ohio State University; 35 cents a copy; $3.00 a year (Canada and foreign $3.50). The address of the editorial and business office is Bureau of Educational Research, Ohio State University, Columbus, Ohio.

The Journal of Higher Education · NOVEMBER, 1931

The Collection and Creation of Knowledge

By S. R. WILLIAMS

The Thrill of the Discoverer Adapted to the Use of College Students

OUR timeworn methods of oral and written examinations are ways of demonstrating that in our educational methods we still believe that the collection of knowledge is more important than the creation of knowledge. To some it is beginning to appear that an education without some information as to how knowledge is created is a lopsided affair. There are those who believe that the collection and creation of knowledge should go hand in hand.

By word of mouth and written page, man has handed down a vast amount of knowledge through the centuries of the past. It has meant travail of mind and soul for many to produce much of this material. Too much do students of this generation take it for granted and go on masticating mental pemmican to be disgorged at the next test or examination. If, in the process of collecting knowledge, our would-be-scholar were led to create knowledge, he would suddenly realize the value and importance of the knowledge which he has inherited from past ages. His accumulated knowledge would have a new significance to him. Nor is this all. The creation of knowledge gives one a thrill. Why did Peary try time after time to gain the North Pole? Because he, as every other discoverer knows, would have a great thrill when that hour should come and he would be standing at the top of the world, where never the foot of man had been before. The Creator of all the Universe sensed this same thrill of creation as he viewed the work of his hand and declared it to be good.

Can this joy which comes to the

creative genius be the experience of students in colleges and high schools? Could such a motivation of school work become contagious? It must be obvious that such work cannot be forced any more than poetry and painting can be obtained at their best by command. Creative work must be spontaneous. After twenty years in the classroom I have no hesitation in saying that creative work, which I make synonymous with project and research work, is as contagious as the measles. Students once seized with the idea that they are pioneering in a new field of thought get a great stimulus and thrill from such work. They like to think they are associated with something big and worth while. To be told that a certain study is good for one is not much of a motivation for the average student.

BEFORE going further, it might be well to make clear, if possible, just what is meant by the creation of knowledge; what is the relation of creation to the collection of knowledge? Let us take an illustration from the field of physics. Almost every trade or profession has certain ideas or beliefs which grow up and are held to be true by a great many in that profession. For instance, jewelers will tell you that after a thundershower they have an extra number of watch springs to replace. Barbers will tell you that they have to sharpen their razors more after a thundershower than at any other time. Some years ago it occurred to someone to question the truth behind the jeweler's belief in the relation between watch springs and thundershowers.

This problem then was suggested to an undergraduate in college. It might just as well have been suggested to a high-school student of physics. The student mentioned seized on the interest of this question at once and began to raise all sorts of other questions regarding it. He discovered that jewelers kept a daily record of repairs. He went through the records of two jewelers in two different cities and plotted the records of replaced mainsprings over a period of five years. Next the officer in charge of the weather observations in that locality was consulted. From him was obtained a record of the number of thundershowers which had occurred during the same five years for which the record of replacement of watch springs had been made. The student wrote to the leading manufacturers of watches to get their opinions, which were as varied as the number of manufacturers. Note, however, that the student during all of this time was collecting knowledge which already existed. Nevertheless, for what was to follow it was an exceedingly important part of his work. There has been a tendency on the part of scientific men to turn up their noses at collectors of knowledge. Often it would have improved their own work if they had done more collecting themselves.

In collecting the data about the replacement of watch springs and the occurrence of thundershowers, our student plotted his curves showing the relative numbers of both over the various months of the year. He confirmed the jeweler's contentions that there was a relation. There is a decided increase in the replacement,

or breakage, of mainsprings during those months in which the most thundershowers occur.

Most jewelers would say that the breakage was caused by the magnetism of the storms, and some would ascribe it to electricity. On inquiry there was found to be a decided difference of opinion among various jewelers.

Once more the undergraduate pressed his questions along other avenues. This time he went into the laboratory. A watch spring was cut into sections about three inches long and bent into a loop with the two ends sticking firmly in a hole in a thin strip of metal. Fifty of these loops were placed in as many holes along a strip of steel a foot long. These pieces of watch spring were then subjected to all sorts of electrical and magnetic fields. Powerful, steady fields and strong, variable fields were tried but no spring broke or showed any tendency to do so. "What other factors besides electric and magnetic fields go with thundershowers?" queried our student. An obvious answer was water. This time he prepared four steel strips with fifty pieces of watch spring, bent in loops, in them. Two of the strips were placed in glass jars having a dish of water beside the strips. The other two strips were placed in similar jars, but these two contained small dishes of calcium chloride for keeping the pieces of watch spring dry. The four jars were then closed by a tightly fitting cover and set away for about four months. At the end of that period most of the springs in the jars with the dishes of water were broken, while not a single one was broken in the jars containing the chloride. By means of the microscope the student was able to demonstrate that rust, due to the water, had weakened the springs at certain points, causing them to break under the tension to which they were subjected in bending. He was able to show that by covering the springs with oil he could prevent breakage in the presence of moisture. He obtained a perfectly clear-cut answer to his original question.

Now note carefully that the student started out collecting all the knowledge he could find, namely, knowledge which already existed. When that was insufficient to answer his question he started to create some knowledge on his own account. That was when he entered the laboratory. Both collection and creation of knowledge were essential to solving the problem. The student had a most interesting experience collecting information on the topic in which he was interested, but the real thrill came to him when for himself he saw the answer to his problem in the experiments which he himself had created and performed. Surely Balboa, standing "with a wild surmise, silent upon a peak in Darien," felt no greater thrill as he viewed the wide expanse of the Pacific than did our student with his small problem solved in such clear-cut fashion.

THE technique of suggesting problems to students is not difficult or mysterious. It is much like fishing. With proper bait, the fish will rise. Fishing is not always as successful at times as it is at others, but a steady persistent endeavor

usually brings positive results. In college work I have been suggesting problems to Sophomores, Juniors, and Seniors. There is no reason why Freshmen should not be included.

In any field of knowledge, the teacher asks the student to come for an hour of conference. Various problems are discussed and the student given a chance to select one which interests him most. Having selected a problem, a preliminary outline of reading is suggested. At the same time the student is urged to collect all the knowledge he can find which is associated with the particular problem he has chosen. It is foolish to do over again what has already been done, unless, perchance, there is reason for believing that the previous work is wrong and needs verification. It is at this stage of the program for our student that the collection of knowledge is important, as it saves much time. Turn the student loose on his problem. Make sure he knows the technique of collecting knowledge, such as the proper use of the library, what books are source books for the field in which he is interested and, particularly, that the indexes of books are placed in the books to be used. Bibliographic work is exceedingly important. Let the student keep a card file of the articles which he reads with a short abstract of the paper underneath the title and reference. He gradually accumulates a splendid background against which he can build the addition to the subject created by his own efforts. This sort of training should come to every college student. If it is learned in one field, the process will be exactly the same for another.

When the question seems to be answered, the student should write up his findings in a paper. Such a paper will indicate far more what a student knows than a dozen examination papers taken under the stress of an examination period and with the possibility of knowledge gained by illegitimate means.

IT HAS been indicated that there is no reason why problems should not be assigned to Freshmen. Project work is given in kindergarten days. The real question here seems to be, when does formal training cease and creative work begin? There has been a tendency to say that college work should be a formal training, namely, collecting knowledge, and when the college student enters the graduate school, then he should begin to create. If project work is successfully carried on in the kindergarten and public schools, and research work in the graduate school, one is justified in asking, What is there so peculiar about college work that no creative work should be undertaken by the college student?

We talk about "tool courses" and there seems to be a place for such courses. However, cannot, as has been said, collection and creation of knowledge go hand in hand? To take another example from physics, cannot a student pick up his vocabulary of scientific nomenclature in connection with his problem work as he reads and digests what he reads? Must a man sit down and measure the diameter of a steel ball with a pair of calipers before he can use the calipers in a research problem? The argument as

put forth here is, that it would give some real purpose to the understanding of the calipers if they were used as a means to an end and not the end itself. Too much do we confuse training with intelligence. Too much have we been saying that a student should have several years of training before he can intelligently go ahead with a research problem. If a tool course is given there seems to be no reason why an element of discovery may not be imparted to it. Such a course can be made just as instructive as the cut-and-dried courses we serve up at present and, certainly, it can be made more interesting. Of course, laboratory work lends itself to special problem work, but no reason appears why the same methods may not be applied to non-laboratory courses.

The lecture system which covers the topics assigned in the textbook is another one of our pernicious heritages. The method of collecting and creating knowledge in the classroom work is just as simple as in the laboratory. The textbook is not to be discarded in the elementary classes, but about it should be built the process of collecting and creating knowledge even in the most elementary courses. Writing from the standpoint of a college teacher I am free to say that teaching in the colleges has not kept pace with that existing in the public and graduate schools. There seems to be no vital motivation for our college work. Students listen in listless fashion to a teacher droning out his lectures which he has obtained, let us hope, from original sources. Why should not the students go to those original sources and read for themselves first-hand? These original sources are not more occult or mysterious than any other source of knowledge, even the lectures of the erudite professor.

The amazing thing to any teacher who tries the problem method is the eagerness with which real students take hold of such work. This type of work means individual initiative on the part of the student. The tutorial system seems to lend itself so readily to this type of work, a system in which student and teacher meet on common grounds of friendship, scholarship, and mutual esteem.

This individual type of instruction will separate the scholars from those who are not as no other method will. It is the scholar whom we are seeking to train. The sooner we can eliminate some of the riffraff we are now trying to instruct in college, the better it will be for higher education in this country. It also seems not impossible that by the same individual method of instruction we might salvage some of the brilliant minds which today we are wrecking by our methods of quantity production.

A Hazard to Research

By CHARLES HARVEY BROWN

The Danger to Research through the Increasing Cost of Scientific Publications

DURING the last few years a condition has arisen which threatens to have a rather serious effect on the availability of certain scientific research material in the sciences, especially in the biological sciences. The charges for individual numbers of German scientific magazines have been rapidly becoming prohibitive and range for many of these periodicals from $75 to $150 per year each. This condition became possible as a logical sequence of the custom, confined almost entirely to the German-speaking nations, of publishing scientific periodicals, not on the basis of annual subscriptions, but rather on the basis of separate charges for each number, which are issued irregularly. Since each number is priced separately, as the publisher may decide, it is impossible for a subscriber to estimate in advance just how much individual subscriptions to German periodicals will cost for a given year.

In the library of Iowa State College, a library confined almost exclusively to science and technology, the cost of all current periodical subscriptions rose from $8,000 per year in 1925 to $18,000 in 1931, and to an estimated cost of $20,000 in 1932. The report for 1930 of the John Crerar Library states that in the "field of medicine alone the cost of German periodicals was nearly $3,000, while the annual cost of all American periodicals was only $1,000." Mr. Bay further states in this report:

> A number of libraries all over the world are becoming more and more exercised on account of the prices of current periodicals, which are mounting by leaps and bounds. Often a single volume, the annual output, of a periodical will reach the price of $100 or even more,—it often becomes a financial burden.[1]

The increase during the last few years in prices charged for scientific periodicals is confined almost entirely to those published in Germany. Several statements have been made as to the reason for the high prices. One of the most common is that the prices are not relatively high if the amount of material given is considered. A letter from one of the larger second-hand book dealers in Germany reads as follows: "The dimensions . . . of them is to be found beyond the normal size. The prices are absolutely, but not relatively high."

Another German dealer also implies that the high price is due to the

[1] The John Crerar Library, *Thirty-sixth Annual Report for 1930*. 1931. p. 26.

amount of material included, and suggests that the publishers or editors should feel compelled to omit the unimportant or less important material. An article in the *Börsenblatt für den Deutschen Buchhandel* mentions the question of honoraria customarily paid in Germany and not paid in the United States. The same article lists the question of insufficient sales as a possibility of the high cost.[2] The longer articles in the German periodicals are in part necessitated by the supposition, as stated in the *Börsenblatt*, that a thought may be expressed in English with fewer letters than in German. Dr. Karl Freudenberg, of the University of Heidelberg, writes in a personal letter of the enormous taxes. This fact, however, in his opinion, cannot explain the great difference in the price of German periodicals and those of other nationalities.

HOW far do these statements justify or even explain the high charges for German scientific publications? Is it true that these publications are high in price on the basis of total charges for the year, but are not high in price as judged by the amount of material included? This statement can be easily tested. With the aid of various members of the research and instructing staff of Iowa State College, a number of periodicals considered the most valuable for scientific research were selected. An attempt was made to choose only those which were comparable in quality of subject-matter. It is realized that the charges for these scientific research periodicals are not typical of the charges for all periodicals; that an examination of all periodicals, popular as well as scientific, would give an entirely different set of figures. The selection of periodicals for comparison was made without any consideration of cost. A different selection in the scientific field would undoubtedly show variations from those given. It is considered doubtful, however, if the variation would be sufficient to change the conclusions. Nevertheless, the figures and the conclusions given are to be considered as applying only to the selected periodicals listed.

A comparison of the charges for certain French, German, English, and American periodicals for 1924, 1925, and 1930 is given in Table I. The prices are figured not only on the cost per year as paid by Iowa State College Library, but also on the cost per printed page. The cost was figured on the basis of the number of pages in order to ascertain the validity of the argument that German periodicals may be absolutely high in the amount paid per year, but are not high if figured in relation to the number of pages included. The list of periodicals used in the compilation of this table is given at the end of this article. The complete supporting tables may be obtained from the author.

The average annual subscription cost of the German periodicals in 1930 was over six times the cost of the English, seven times the cost of the American, and over eight times the cost of the French. The differences are obviously very great. How far

[2] Oldenbourg, Friedrich. "Zur Weltgeltung des Deutschen wissenschaftlichen Schrifttums," *Börsenblatt für den Deutschen Buchhandel*, XCVIII (April 9, 1931), pp. 325–31.

can the discrepancies be explained by the fact that the German publications issue very many more parts a year? What is the cost per printed page?

If the cost per year is divided by the number of pages published per year, we find that the average cost of the English periodicals in 1930 is less than 1.4 cents per printed page. The average cost of the American is less than .9 cents per printed page. The average cost of the French is less than 1.2 cents per printed page, while the average cost of the German is nearly 3.8 cents per printed page. The average cost of German publications per printed page is over three times the cost of the French, nearly three times the cost of the English, and over four times the cost of the American. Apparently the German scientific periodicals are high in price, both absolutely and relatively as figured on the number of printed pages. The material included fails to justify the high prices.

The question of honoraria to writers, which are paid in Germany more generally than elsewhere, has been proposed as a cause of high prices. The German periodicals which announce the amount of honoraria have practically a rate of 40 marks for a signature of sixteen pages, or 60 cents per page. An honorarium of 60 cents a page is not enough to account for the high prices. At the present prices twelve subscriptions to some of these periodicals would pay the entire cost of the honoraria; and twenty-five subscriptions to a majority of the list would fully cover the honoraria. Certainly American scientists would be loath to take any step that would limit the compensation paid their professional colleagues in Germany.

Neither can the high cost of printing be assigned as a factor in the high prices. It is probable the cost of printing in the United States is much greater than in Germany; certainly

TABLE I

COMPARISON OF COSTS OF GERMAN, FRENCH, ENGLISH, AND AMERICAN PERIODICALS

	German Periodicals[a]	French Periodicals[b]	English Periodicals[c]	American Periodicals
	(21)	(10)	(8)	(11)
(1)	(2)	(3)	(4)	(5)
Average annual cost Iowa State College 1924	$31.87	$ 6.12	$10.34	$10.84
Average cost per page 1924	.0174	.0083	.0181	.0088
Average annual cost Iowa State College 1925	38.35	6.25	10.20	10.81
Average cost per page 1925	.0198	.0103	.0158	.0089
Average annual cost Iowa State College 1930	70.97	8.25	11.20	10.16
Average cost per page 1930	.0378	.0117	.0137	.0082
Average length of article in pages	22.3	38.2	11.8	15.7
Average number of current subscriptions in United States[d]	42.5	37.1	53.2	68.3

[a] Of these 21, 4 were not taken by Iowa State College in 1924 and are not included in 1924 averages.
[b] Of these 10, 5 were not taken by Iowa State College in 1924 and are not included in 1924 averages.
[c] Of these 8, 2 were not taken by Iowa State College in 1924 and are not included in 1924 averages.
[d] According to Union List and Supplement 1927–31.

labor is much more highly paid here. Yet I have been informed by a reputable publisher that he could take over the American subscriptions for certain of these German periodicals, print editions in this country for American subscribers alone, and supply the periodicals at less than the amount charged by German publishers who from one setting of the type supply not only American subscribers but subscribers all over the world.

What are the present tendencies? Are the prices for German periodicals tending to descend from the extremely high levels, and are the costs of the English, American, and French periodicals increasing? If the costs in 1930 are compared to those of 1924 we find a decrease in the cost per printed page of the English periodicals from 1.8 cents in 1924 to 1.37 cents in 1930. The cost of the American has decreased from .88 cents to .82 cents. The cost of the French has increased from .83 cents to 1.17 cents. The cost of the German has increased from 1.74 cents to 3.78 cents—more than a 100 per cent increase from a previous high level as compared with an actual decrease in the American and English, and an increase of 40 per cent in the French. The increase in the French, however, is not serious, as the absolute prices of the French in 1930 were not high. The increase in the French was made from a low level in 1924, while the increase in the German was made from a previous high level.

Dr. Raymond Pearl in a comparison of the prices of German scientific books, not periodicals, in 1926, 1927, and 1928, found exactly the same tendencies.[3] The general agreement between Dr. Pearl's report of the increases in prices of German books and the present study of prices of German periodicals is remarkably significant and points out clearly the dangers these tendencies offer to scientific research.

On the other hand there has been, during these three years, an equally consistent and steady increase in the average price per page of commercially published German and French biological books. German biological books, judged by our samples, were 23.3 per cent higher in 1928 than in 1927, and 35.8 per cent higher in 1928 than in 1926. The corresponding percentage increases in the price of French biological books were 25.0 and 28.6 per cent. In the case of the French books the absolute price is so low that the percentage increase does not matter practically. The German case is not so good, however. Their biological books were absolutely the highest priced in 1928, and also are increasing in price at the most rapid rate, so far as may be judged from our sample during the years 1926 to 1928 inclusive. While it is easy to understand and appreciate the economic considerations which lead to increasing costs of commercially published books in France and Germany, it is a question whether in the latter country the publishers are not dangerously close to the point in their pricing of scientific books where they will bring into operation that other sad economic law of which the effect is that absolute returns diminish. There can be no great profit in publishing books at such high prices that nobody buys them.[4]

What will be the result if the present scale of prices for German periodicals continues? In order to judge the future, a summary of past

[3] "Cost of Biological Books in 1928," *Quarterly Review of Biology*, III (December, 1928), pp. 600 ff.
[4] *Ibid.*, pp. 601–602.

conditions is desirable. The *Börsenblatt*, previously quoted, gives an interesting account of the history of the world recognition of German scientific publications. Before the war these publications were greatly used in this country and regarded as necessary for scientific research by American scientists. German scientific research had world recognition. C. W. Andrews, for many years librarian of the John Crerar Library, and himself a chemist, stated at the beginning of the century that in his opinion the first course in chemistry should be one in German.

DURING the war the German language in this country was under a cloud; the teaching of German in our high schools and colleges was to a large extent discontinued; the use of German research material was necessarily greatly curtailed. The increasing recognition of the scientific work of Germany which had existed up to 1914 came to a sudden end. It was found that, if necessary, American scientific research, although greatly handicapped, could exist without the current German scientific publications.

Since the war the change in attitude in this country has been rapid. German courses have been reintroduced into our schools. Our research and educational institutions are requiring more and more that members of their staffs have a thorough knowledge of German. German scientific literature has been receiving during the last ten years a steadily increasing recognition.

Is this trend again to be reversed? And shall we be compelled to discontinue our use of German scientific publications through our inability to pay the high prices charged? Such a procedure would be a decided handicap to research work in this country. The burden of the high cost of German publications which has been steadily increasing for the last ten years is more than our budgets can possibly stand, and more than we are justified in paying, in the opinion of many university administrators. Must we come to the state when we shall be obliged to say to the research workers, to the professors who use our libraries, that we cannot afford to supply them with the material published in Germany, that the results of German scientific research must be made known to them only through abstracts or "referate"? Such a use is far from satisfactory; but if the present cost continues it may be necessary.

As far as our own libraries are concerned, we can cancel our subscriptions; we can make one copy of publications, such as the various sections of the *Zeitschrift für wissenschaftliche Biologie*, serve a number of different universities which are now taking it. We in this country could probably, if necessary, cut by eighty per cent our subscriptions to these high-priced German periodicals, and rely on the abstracts and the intercirculation of these periodicals among the libraries concerned. Mr. Bay, of the John Crerar Library, writes in a letter as follows:

> The increase in prices makes it impossible for any of us to make a definite and reasonable budget. Our budgets are increasing all the time, but the money is wholly disproportionate to the educational development resulting from their use. . . . I am conferring at present with my brother-

librarians in the city in an effort to distribute the burden equally, and especially to avoid duplication of the most burdensome of this material.

Iowa State College has already arranged with her sister university, the State University of Iowa, to consider together which periodicals might be canceled by one of the two institutions. There will be some loss in efficiency. There is a greater danger, however. The cancellation of a considerable number of subscriptions may mean increased prices for the remaining subscribers. These increased prices will cause further cancellations, which conceivably might result eventually in the cessation of such publications—a most serious loss to research throughout the world.

CERTAIN possibilities have been mentioned by the *Börsenblatt* as to measures which could be taken to create increased demand. Possibly decreases in prices would automatically increase demand, not immediately but eventually. These measures proposed in the *Börsenblatt* apply more to books than to periodicals. There are some suggestions, however, partly implied in those given in the *Börsenblatt*, which might be offered.

First, limit the length of the articles. Condense the material. As stated in the *Börsenblatt*, the scholar should not be so "awkward" as always to begin with Adam and Eve in the presentation of the problem. Much of the historical introduction could be omitted. Table I gives the average length of articles in the German scientific magazines as compared with the average length of articles in English, American, and French. Articles in German magazines, as noted, are double the length of the English, about fifty per cent longer than the American. The inclusion of some monographic periodicals in the French list invalidates to some extent a comparison with the French.

Second, limit not only the poorly written works, as stated in the *Börsenblatt*, but also the less important articles from the standpoint of research. Many articles are published which ought not be published. Indeed, this complaint does not apply only to German scientific publications. It is more serious, however, in the case of the German periodicals since they are issued at such high prices.

Third, attempt to compensate for decrease in cost by increasing the number of subscribers. It is believed that the number of subscriptions to these high-priced German periodicals will eventually be greatly decreased. American libraries cannot afford to pay present prices. If wholesale cancellations occur, the result may be unfortunate. If the German publishers will attempt to decrease prices and increase the number of subscribers, the continuance of our use of the most valuable scientific research work of Germany may not be threatened.

Those who have been in any contact whatsoever with scientific research have a great admiration for the research publications of German scientists. There is a keen appreciation in this country of the difficulties of German publishers. No attempt is made here to minimize these difficulties. Apparently, however, the present tendency in price will limit

more and more the use of the original publications of German scientists. This limitation will result from a decrease in subscriptions, thus starting a vicious circle that may even threaten the existence of these publications. The suggestions are offered in a desire to make possible a continued use in this country of the greatly esteemed German scientific publications.

In order that the immensely valuable records of German scientific research may continue to be available, it is hoped that American scientific organizations and the American Library Association will consult with similar organizations in Germany to find some solution to the difficulties caused by the increasing high prices of German scientific publications. It would be regrettable if the study and use of the German language in this country should revert to the conditions prevailing during the war; if German scientific publications, except through abstracts, should no longer be available to the scientists here.

THE TITLES OF THE FOREIGN PUBLICATIONS USED IN COMPILING TABLE I

GERMAN—

Anatomischer Anzeiger
Archiv für experimentelle Pathologie und Pharmakologie
Berichte über die gesamte Biologie (Abt. B.)
Biochemische Zeitschrift
Centralblatt für Bakteriologie, Parasitenkunde und Infektionskrankheiten (Erste Abt. Originale)
Centralblatt für Bakteriologie, Parasitenkunde und Infektionskrankheiten (Erste Abt. Referate)
Centralblatt für Bakteriologie, Parasitenkunde und Infektionskrankheiten (Zweite Abt. Referate)
Gartenbauwissenschaft
Jahresbericht Neurologie und Psychiatrie
Just's Botanischer Jahresbericht
Strahlentherapie (Originale, Sonderband)
Virchows Archiv für Pathologische Anatomie und Physiologie
Zeitschrift für die gesamte Anatomie (Erste Abt.)
Zeitschrift für die gesamte Anatomie (Zweite Abt.)
Zeitschrift für die gesamte experimentelle Medizin
Zeitschrift für Physik
Zeitschrift für wissenschaftliche Biologie (Abt. A, B, C, D, E.)

FRENCH—

Académie de Médecine (Bulletin)
Annales de Parasitologie Humaine et Comparée
Annales de Physique
Archives de Biologie
Archives de Morphologie Générale et Experimentale
Archives de Zoologie Experimentale et Générale
Institut Pasteur (Annales)
Société Botanique de France (Bulletin)
Société de Chimie Biologique (Bulletin)
Société de Pathologie Exotique (Bulletin)

ENGLISH—

Annals of Botany
Biochemical Journal
British Journal of Radiology
Journal of Anatomy
Journal of Pathology and Bacteriology
Journal of Physiology
Quarterly Journal of Medicine
Royal Society of Medicine (Proceedings)

AMERICAN—

American Journal of Anatomy
American Journal of Botany
American Journal of Pathology
American Journal of the Medical Sciences
Endocrinology
Journal of Biological Chemistry
Journal of Comparative Neurology
Journal of Experimental Medicine
Journal of Experimental Zoölogy
Physical Review
Surgery, Gynecology and Obstetrics

Paradoxical Trends

By HAROLD RYPINS

Higher Standards of Admission to Professional Schools with Remarkable Increases in Enrollment

THE rapid growth of higher education in the United States during the past forty years is a phenomenon before which one can only stand in awe and amazement. In the year 1890, the percentage of college students between the ages of eighteen and twenty-two years constituted only 2.34 per cent of all persons in that age group. During a period of twenty-five years, the percentage of this age-group who were students in American colleges rose gradually but steadily to 4.16 per cent. By 1916 the percentage had jumped suddenly to 5 per cent; it fell slightly during the war, after which the curve rose sharply, reaching 6.32 per cent by 1920, 10.41 per cent by 1925, and 11.77 per cent by 1928. In 1930 the high point of 12 per cent was achieved.

These figures, which have been corrected to take care of the doubling of the country's population during the past forty years, show not only the extraordinary fact that in this short period the number of American college students has multiplied five times, but that the number enrolled since the end of the war had almost tripled in one decade. In 1928, there were enrolled in our colleges the staggering number of 868,793 students. The undergraduates alone comprised 695,219, which is well over .5 per cent of the total population of the United States, and as previously indicated, 12 per cent of the population of college age. Since the number of students increases at the rate of one hundred thousand every two years, there cannot be less than one million students in American colleges and universities at the present moment.

No one will deny that this is an expression of an exceedingly democratic tendency in higher education. Practically every young man or woman in the United States desiring a college education now has the opportunity to obtain one. Certainly, there is nothing exclusive about a college educational system which takes care of 12 per cent of the entire population of college age and is apparently prepared to educate an increasing percentage should the demand arise. Paralleling this astonishing trend in undergraduate education, there has, however, emerged what appears to be an aristocratic, or at least an exclusive movement in the professions, particularly in medicine, dentistry, and law.

Since I am best acquainted with the situation in the profession of medi-

cine, and also because the aristocratic tendency is more marked and more obvious in medical education than in any other profession, I shall draw my illustrations largely from this province. I wish, nevertheless, to point out that the influence of the trend in medicine is rapidly spreading to the fields of dentistry and law, and in a lesser degree to the other professions.

Table I shows the number of medical colleges, number of students, and the number of graduates since 1890. The causes of this striking change are

TABLE I

NUMBER OF GRADUATES OF MEDICAL COLLEGES SINCE 1890

Date	Schools	Students	Graduates
(1)	(2)	(3)	(4)
1890.....	133	15,404	4,454
1900.....	160	25,171	5,204
1904.....	160	28,142	5,747
1910.....	131	21,526	4,440
1920.....	85	13,798	3,047
1925.....	80	18,200	3,974
1930.....	76	21,579	4,565

worthy of consideration. I again direct attention to the fact that at the present time, with only 76 medical schools, there are practically the same numbers of students and graduates as in the year 1900, when there were nearly twice as many medical schools. At that time medical education was generally conducted on a commercial basis, and the country was overrun with small medical schools, whose students not only paid fees for their maintenance, but provided snug little annual dividends to the members of the proprietary faculties. Even in those days there were excellent medical schools in the United States, such as Pennsylvania, Harvard, and Johns Hopkins, but the physicians trained in these university medical schools were forced to compete as equals with the graduates of fly-by-night, low-standard, commercial institutions.

Largely as a result of the survey of American medical schools made by Abraham Flexner, of the Carnegie Foundation, in co-operation with the Council on Medical Education of the American Medical Association, a fund of distressing information concerning these schools accumulated, whereupon the strongest state medical boards, under the leadership of the New York State Department of Education, forced many of these institutions to consolidate and all of them to raise their educational standards, which resulted in the elimination of those unable or unwilling to comply.

THE first profession to be affected by the increased educational requirements of medical schools was dentistry. Prior to 1916 American dental schools required for admission four years of high school only and in most instances the professional course in dentistry was three years in length; in 1916, this was increased to four. In 1921, dental colleges in New York state demanded one year of collegiate predental training, which was increased in 1927 to two in addition to the four years of dental study, so that the leading dental schools of the country now require six years of study following graduation from high school, which is equal to the minimum requirement in American medical schools.

While this increase in the requirements in dental education may be

attributed partly to the influence of the movement in medical education, other factors have helped to bring it about. The same recent advances in biological science which have necessitated better training for the medical profession have inevitably prevailed in dentistry as well. The dental profession is gradually recognizing the relation of dentistry to diseased conditions throughout the entire body and realizes that dentistry can neither maintain its professional prestige nor co-operate intelligently with the medical profession unless its practitioners are scientifically grounded. In fact, an influential group of dental educators now takes the position that the dentistry of the future will be a specialty of medical practice, requiring preliminary medical training as much as ophthalmology, proctology, and other specialties. They go so far as to advocate the training of dental and medical students in the same curriculum and by the same faculty.

The situation in dental education, however, differs from that in medicine in that at the present time there are still reputable schools of dentistry giving a five-year course, so that the prospective dentist may select a shorter or a longer course of training. Furthermore, there is no excess of applicants for admission to American dental schools, so that students with the necessary preliminary education have no trouble in finding opportunities to engage in the professional study of dentistry.

There have been no important changes in the fields of engineering, architecture, and theology, so far as I am aware. The most striking recent advancement in qualifications for admission to the practice of a profession has been in the sphere of law. There have always been marked differences in the requirements for admission to the bar throughout the country. In some states the applicant's ability to read the English language and the testimony of two witnesses as to his moral character are sufficient to procure admission to the bar. In New York, on the other hand, there have always been distinguished law schools, requiring a full academic course of four years for admission, but until recently it was not necessary to attend such schools. Admission to the bar could be obtained by serving a clerkship in a lawyer's office and passing the bar examinations. Within the last few years, recognizing that we need better rather than more lawyers, the New York State Court of Appeals has changed the requirements so that the completion of two years of college is necessary for admission to the practice of law.

In spite of the reiterated claim that many potential Lincolns would be forced by this revision to blush unseen, the young student may still without difficulty secure an opportunity to enter upon the professional study of law. While the road to the bar is longer and more arduous than formerly, it is still broad enough to carry all who desire to travel it.

APPARENTLY, then, these augmented requirements for admission to the professions of medicine, dentistry, and law not only do not parallel the increasing democratic tendency in undergraduate education,

but run counter to it in what might be called an aristocratic direction. The fact that it requires today much more time, training, and money than ever before to become a practicing member of any one of these professions, while by no means prohibitory to the ambitious student, naturally limits the number of those who will be able to qualify, restricting membership to those who are more zealous and those who are more fortunate than their fellows.

Before considering the wisdom and justice of this aristocratic trend in professional training, I should like to indicate certain restrictions upon the applicant for admission to American medical schools, which have no analogy in the other professions.

Because the profession of medicine is one which permits the successful members to combine the pleasure of scientific work with the pleasure of earning a reasonable livelihood, or because it affords opportunities for humanitarian efforts, or perhaps because it gives to its members, deservedly or undeservedly, a certain social prestige, or again because it is thought to permit its members the greatest amount of individualism, or even because it is the most difficult profession to enter—for any and all these reasons—the number of those demanding admission to our medical schools is not only out of proportion to the number desiring to enter other professions, but is far and away greater than can be adequately trained in the schools at present maintaining proper facilities for medical education.

Before the war, when only four years of high school were required for admission to medical schools, there was little if any difficulty in entering. Curiously enough, increasing the preliminary requirements, first one and then two years, and in the case of many schools, even three and four years, far from creating, as was expected, a dearth of applicants, has appeared to make medical training seem all the more desirable, and the number of applicants has increased. At the present time American medical schools are prepared to receive approximately six thousand Freshmen each year. These are selected from over twelve thousand eligible applicants, whose multiple applications in various schools give us approximately twenty-eight thousand applications annually. This situation is without precedent in the history of professional education. It means that having obtained his preliminary education, the average candidate for admission to medical study has only a fifty per cent chance of being accepted in a medical school. The problem of discriminating among some hundreds of thousands of applications, of which one-half must inexorably be discarded, is one which generally concerns the deans of medical schools.

Increasing use is being made of a psychological aptitude test for the study of medicine, devised by Professor Moss, of Washington University. This is being given at the same time throughout the country this spring to all college students intending to apply for admission to American medical schools, and is expected to assist greatly in making the selection of candidates more objective and therefore more reliable.

While the excess of medical applicants in the face of a fixed and limited number of places is the strongest factor promoting the aristocratic tendency in medicine, there are also other determining elements. For example, medical schools maintained as part of state universities, as in Minnesota, Wisconsin, Indiana, Illinois, and Michigan, have been forced to give preference to local citizens whose fathers are taxpayers with the result that few and in many cases no applicants from outside states are even considered for admission. Again certain schools, such as Harvard, Yale, Hopkins, and Chicago, require four years of undergraduate college work for admission, which automatically bars a large number of applicants who cannot afford to spend eight years after high school in study for the medical degree. Lastly, a number of medical schools give exclusive preference to students from adjacent territory. A few schools take no women at all, and some only a limited percentage. Whatever their advantages, these secondary principles all tend in the direction of an exclusiveness which must lead ultimately to intellectual inbreeding and provincialism.

Finally, geography plays a not inconsiderable and wholly unappreciated part in diminishing the chances of the student to secure admission to a medical school. For example, there are in Greater New York five medical schools having a total freshman registration of not more than six hundred. At least a hundred places are given to applicants from distant parts. This leaves only five hundred to be filled from over five thousand applications put in by students in the vicinity. Allowing for duplication, probably no less than two thousand individual applicants are represented. In other words, the number of openings in medical schools is not distributed geographically in proportion to the geographic distribution of the applicants. An additional disadvantage affects New York students applying to medical schools at a distance, where it is unfairly concluded that New Yorkers who do not obtain admission to any of the five medical schools in New York City must be undesirable candidates. Outside schools naturally alert for the best-endowed applicants do not care to consider these students, although, as a matter of fact, many of them are undoubtedly better material for medical training than applicants accepted from local vicinities.

I HAVE advisedly used the word "paradoxical" to describe the prevailing situation in higher education, for the reason that upon analysis the cross currents are not so contrary as they superficially appear. As a matter of fact, there has not been any sudden or decided aristocratic development in the professional schools. They have improved their facilities in rough proportion to the growth of the general population and the needs of the country for professional men. The extraordinary increase in the number of undergraduates in American colleges during the past forty years, more particularly since the war, has multiplied many times the number whose college training naturally inclines them toward professional careers. Whether or not the tremendous expansion in

college facilities is altogether to the best interests of our democracy, and whether or not we have arrived at a saturation point in undergraduate training, are questions beyond the scope of this paper.

There is, however, no doubt that the professions, particularly the profession of medicine, have done wisely not to imitate the democratic trend in undergraduate education. Aside from the impossibility of providing for the education of professional students high-grade institutions that could equal the rate of increase in undergraduate schools, competitive restriction for admission to the study of the professions is working out to the benefit both of the professions themselves and the public at large. The maintenance of proper facilities and high educational standards, the restriction of the number of students admitted to professional study and the competitive selection of these students, has heightened the intellectual pace in professional schools, raised the standards of the professions, and given to the people a selected group of properly qualified professional men.

Graduate Work in Land-Grant Institutions

By R. E. BUCHANAN

"The axiomatic dependence of graduate work upon research and the specific designation of the land-grant institutions by States and Nation as great research agencies make advisable a somewhat detailed review of the whole problem of graduate work in the land-grant fields. This is particularly desirable inasmuch as in some instances the initiation and development of such graduate work has proved highly controversial."[1]

THIS quotation is an introduction to the section on graduate work included in the *Survey of Land-Grant Colleges and Universities*. It is practicable here to present and to comment only on certain points of view, theses, and recommendations as they are therein set up.

Land-grant institutions are those designated by the legislature of each state of the Union to be recipients of the endowments of the Federal Morrill Act enacted particularly to encourage education in certain fields. Obviously, a clear definition of the land-grant field in reference to graduate work is a prerequisite to a discussion of its status. Many fields included in land-grant institutions are not to be considered distinctively land grant. The Survey statement is:

> For the purpose of this survey, therefore, the graduate land-grant field is defined as including training, beyond the bachelor's degree, in agriculture, engineering, home-economics, veterinary medicine, commerce and business, the basic sciences (mathematical, physical, biological, social, and economic), and the training of teachers in all of these. The legitimacy of graduate work in all these subjects in land-grant schools where there is need and the facilities are available is regarded as a necessary postulate to the adequate development of the primary objectives of land-grant education.[2]

The first thesis defended in the Survey report may be stated: The disciplines grouped together as characteristic of land-grant education are fully worthy of recognition and development on the graduate level. It is noted that, in the earlier days of graduate development within faculties strongly imbued with the classical tradition, there was marked opposition to graduate work in the applied fields. This seriously interfered with proper recognition of these fields in certain institutions; however, as an important

[1] United States Office of Education. *Survey of Land-Grant Colleges and Universities*. Washington: Superintendent of Documents, 1930. Vol. II. p. 704. (Bulletin, No. 9)

[2] *Ibid.*, pp. 708–709.

or determining factor such opposition has largely disappeared or become ineffective in recent years. In some cases the feeling still exists, but a "classical majority has become a minority."

That such a feeling does persist is shown in Abraham Flexner's recent attempt to discredit technical education on the graduate plane. Therein occurs a paragraph which illustrates well the type of ridicule once held to be cogent in combating the university encroachments of science and technology. He says:

> Let us turn for a moment to schools of domestic science. One wonders what "science" means to the university authorities who conduct or condone faculties of domestic science. The departments bloom like the cedars of Lebanon at Columbia, Chicago, and the state universities.[3]

Certainly, on the succeeding pages Flexner develops what he evidently regards as a masterly indictment of one of the land-grant fields, that of home economics. But just what does he mean by asserting that these "departments bloom like the cedars of Lebanon"? To assume that the author believes the "bloom" of the cedar to be conspicuous would be to discredit his background of science, at least his botanical knowledge. To assume that he really means what he says, that domestic science in the institutions enumerated is as inconspicuous as the bloom of the cedar is to run counter to his further argument and exposure. Perhaps he has in mind a biblical allusion. It is possible that he recalls —albeit hazily—the antiphonal strain of the Israelites of old:

> The righteous shall flourish like the palm tree,
> He shall grow like a cedar of Lebanon.

But this cannot be, for the context shows clearly that he regards the position of domestic science in a university as most unholy. Just what, may we ask again, does he mean by "bloom like a cedar of Lebanon"? The answer is clear to anyone who will trouble himself to make a critical examination of the remainder of his argument. The ineptness of the phrase is typical of the ineptness of the entire thought and argument developed. As with many another attack on technical developments on the university level, it is a weird mixture of misplaced classical allusion, fact, fancy, satire, and the smug complacency of the classicist critic. Apparently we are to have inflicted upon us a series of catch phrases ("Flexnerisms"?) equal in banality with the recurrent flood of "Menckenisms."

BUT why, the reader may well ask, pause to note the vaporings of a gentleman who has been recently divinely commissioned to create a super-university? Only to emphasize that even yet those who are working in land-grant (technical) fields find themselves constantly annoyed by recrudescences and restatements of educational ideas and arguments long ago discarded or adequately controverted. We may wax Flexnerian and term his statements "atavistic educational mid-Victorianism."[4]

[3] Flexner, Abraham. *Universities: American, English, German.* New York: Oxford University Press, 1930. p. 153.

[4] In some instances apparently facts are twisted. For example, a purported doctoral dissertation (D.Sc.) from Kansas Agricultural College is commented upon unfavorably. The fact is, this institution does not and has not conferred the earned D.Sc.

In discussions such as that by Flexner, there is frequently the assumption that graduate work on a proper plane postulates a certain type of subject-matter. That certain subjects or disciplines are by their very nature not appropriate to graduate development is urged as a valid and devastating objection to the recognition of subjects such as those of land-grant fields. What can be suggested that will justify graduate work in subjects like animal husbandry, or electrical engineering, or horticulture? Is not a mere listing of the names sufficient to show the impropriety of university recognition? Some analysis is apparently called for. Probably all will admit that the distinguishing feature of graduate work is research. To justify graduate work in a field such as animal husbandry, for example, it must be shown to be one in which research is possible. What constitutes research in animal husbandry? It may be defined as the utilization of all necessary and appropriate techniques and facts developed in all the arts and sciences in the solution of problems relating to farm animals. In opposition to such a definition it is often urged that the utilization of any specific science or its technique in the solution of the problems of animal husbandry renders the research one in the science utilized and not in animal husbandry. This is fallacious reasoning. The point of focus, the objective, is of primary importance and must not be ignored. An illustration will make this clear. We may rephrase our statement to define research in one of the basic sciences such as chemistry. Our definition would then read, research in chemistry is the utilization of every applicable technique in the solution of problems relating to the constitution and interreactions of matter.

Suppose that from such research are eliminated all techniques not strictly inherent or intrinsic, as was suggested for animal husbandry. All mathematics would be dropped, for certainly mathematical treatment is not distinctively chemical. This would blot out a proportion of the research possibilities, in fact most that is not purely descriptive. Let us eliminate further from chemical research all physics and the physics techniques, and all of the biology, including physiology and all of the geology and mineralogy. Nothing of significance would be left. It is evident that most of the chemical techniques are based upon those of other sciences. That which is distinctive of chemical research is its point of view, the objective and not the techniques. The sciences and arts are intricately interwoven. With these facts in mind, and remembering that all of the techniques of all the sciences and arts are available, it is surely evident that research in animal husbandry can be placed upon just as high a plane as research in chemistry. It is lack of appreciation of this fact that has led to serious misunderstanding by those narrowly trained. The conclusion seems to be justified that the land-grant fields are for the most part entirely suitable for graduate development.

It follows that what constitutes work on the university or graduate level is not determined to any considerable degree or necessarily

by subject-matter. President Butler, when he escapes for the moment his prohibitional and political hallucinations, discusses certain educational problems sanely. Recently he stated:

> The true university is not a collection of colleges or a group of professional schools. It is rather an institution of higher learning, where scholars of high competence guide students prepared by liberal education into advanced studies with the aid of libraries, laboratories and seminaries, and which aids in the dissemination of knowledge. Truth is its possession, the advancement of truth is its method, and the dissemination of truth is its atmosphere.[5]

It is the argument of the Survey report that land-grant graduate work can be placed on this level.

THE growth of graduate work in land-grant fields has apparently been relatively inevitable. Its origin is to be found in the emphasis that practically from the foundation of the institutions has been placed upon research. In some cases, the land-grant fields were incorporated into a state university, and came to be recognized as faculties or colleges more or less co-ordinate with older constituent colleges. The graduate units in such land-grant fields developed, in general, as a part of the normal graduate growth of the institution as a whole. A factor of importance in both separate and combined institutions was the clear realization by some of the pioneer workers in the land-grant fields that a great amount of fundamental research in the sciences was essential before technical education could have a content of subject-matter comparable to that of the older fields. Later large subsidies came from national and state governments for research, first in agriculture and the related sciences, and afterwards in other land-grant fields. The resources which have become available to land-grant institutions have made possible and necessary the employment on their staffs of well-trained men, capable of carrying forward research in science and in technology. Inevitably these men trained their apprentices. Max Mason has well stated that the ideal graduate situation is such apprenticing of eager and capable students to the leaders in research. Whether formally so recognized or not, any great research agency which conducts its work in this manner is *ipso facto* a graduate school, and the formal recognition of the fact has not usually been long delayed.

Of the 52 land-grant institutions listed, 48 confer the degrees, Master of Science or Master of Arts, and 22 the degree, Doctor of Philosophy. The enrollment of graduate students in these institutions has increased from 630 in 1900 to 11,497 in 1928. Undergraduate enrollment in 1928 was 150,697, a ratio of graduates to undergraduates of 1:13.1. Eight of the institutions, University of California, Iowa State College, Massachusetts Agricultural College, Massachusetts Institute of Technology, University of Minnesota, Cornell University, West Virginia University, and the University of Wisconsin, have a ratio of graduates to undergraduates of 1:10 or more. A total of 464 degrees Doctor of Philosophy were conferred in 1928 by 17 institutions.

[5] "Dr. Butler Asserts That We Have Only Eight Real Universities," *The New York Times*, January 18, 1931.

Of these, 7 institutions conferred 25 or more each, none of the remainder as many as 10. It is evident that graduate work in land-grant institutions is of major significance, and that it is rapidly growing.

A SECOND thesis developed at some length in the Survey report is the inadequacy of agencies purporting to accredit the graduate schools of the country. These agencies are enumerated, the only one worthy of special consideration being the Association of American Universities.

> While it has adopted no regulations and has formally approved no standards, nevertheless, the discussions of the excellent papers on various phases of graduate work, and their publications in the annual proceedings have done much to strengthen the policies of the constituent membership and to improve and set standards for other institutions.[6]

This Association was formed in 1900 by 11 universities "for the purpose of considering matters of common interest relating to graduate study." It listed 28 member institutions, two of which were Canadian, in 1928. The Association has set up an excellent accrediting agency with reference to undergraduate collegiate standards. It has made no direct claim to constitute an accrediting agency for graduate schools, nevertheless, informally it has taken the attitude that membership in the Association is a prerequisite to acceptability of an institution's graduate work and standing. The documentary evidence of this attitude is presented. The situation is complicated by the fact that the Association has departed far from its original basis for acceptance of members, or rather of invitation to membership. It has become an exclusive social fraternity to which it is poor form to seek to gain admission. Although it has in its membership some graduate schools which can scarcely be termed better than second or third rate, it has consistently refused to invite to membership institutions of the separated land-grant type, such as the Massachusetts Institute of Technology with its well-developed graduate and research program. The administrative officers of some member institutions are using

> lack of membership on the part of other institutions, quite without other warrant, in the determination of graduate standing of transfers, acceptance of credits, and advice to applicants for admission. . . . The position of the association has led to serious embarrassments and misunderstandings between land-grant colleges and their alumni on the one hand and foreign governments and foreign students on the other.[7]

Without phrasing it in so many words, there is a clear implication in the report that either the Association should, in fairness, restate its constitution and objectives, and disclaim all ambitions to act as an accrediting agency, or it should frankly face the responsibilities and accredit graduate schools, both within and without its membership. The difficulties of doing this, particularly within its present membership, are evident. The Survey does not suggest it:

> It is not the intention to advocate that any elaborate machinery for the accrediting of graduate schools be set up by any agency.

[6] *Op. cit.*, p. 724.

[7] *Ibid.*, pp. 726–27.

However, united action on the part of the land-grant institutions in association with other technical institutions to protect the standing of their graduate work should be taken to meet the insistence of colleges, governments, and graduate schools themselves that some kind of guarantee of standards be developed.[8]

It is urged, as a solution,

that the Association of Land-Grant Colleges and Universities take steps (1) to set up the machinery for any standardization or accrediting that may be desirable or necessary in graduate work in land-grant fields; and (2) to adopt the general principle of accrediting of graduate work (so far as this may be needed) by fields of research or subject-matter fields rather than by institutions.[9]

THE Survey gives three interesting classifications of land-grant institutions from the standpoint of their graduate development. Two institutions offer no advanced degrees in any land-grant field as previously defined. Thirty-one confer the Master's degree but not the Doctor's, 19 confer the degree Doctor of Philosophy. The Ph.D. is offered by 17 in agriculture, by 10 in engineering, by 9 in home economics, by 14 in teachers' training, by 19 in arts and sciences, by 4 in commerce and business, and by 2 in veterinary medicine.

The classification of colleges and universities by the Association of American Universities for the purpose of determining eligibility of graduates to admission to graduate schools brings out some interesting facts. Eight land-grant institutions are members of the Association. Of the list of 22 accredited technological institutions 11 are land-grant. Of the list of 178 colleges accredited 14 are land-grant. There are altogether 19 land-grant schools not on the accredited list. Of these all but two confer the M.Sc. in one or more land-grant fields and several confer the Ph.D. The report emphasizes:

The standards set by the Association seem to be entirely reasonable. It is somewhat anomalous, therefore, that an institution on the unaccredited list presumes to offer graduate work. This may be justified in some cases, but it is urgently recommended that all land-grant schools qualify for accrediting by this association. The accrediting by a regional association is not enough.[10]

The objectives of graduate work in land-grant fields are discussed in some detail. They are listed as advancement of knowledge through research by staff and students; the training of students for research; the training of students for teaching; and the training of students for leadership or management in certain industrial fields.

Two rather different points of view are to be seen in two recent statements concerning the functions of the modern university or graduate school. Flexner lists four such functions: the conservation of knowledge and ideas; the interpretation of knowledge and ideas; the search for truth, and the training of students who will practice and carry on. A Faculty Committee of the University of Pennsylvania also recognizes four: the creation of new knowledge by actual research; training in the methods of independent study; the conservation and dis-

[8] *Op. cit.*, p. 727.
[9] *Ibid.*, p. 728.
[10] *Ibid.*, p. 734.

semination of knowledge by teaching; and the application of this knowledge through direct service to the public. The latter compilation, though not originating from a land-grant institution, nevertheless characterizes well the point of view of such.

The Survey points out with some degree of particularity the factors which determine the character and quality of graduate work in any institution. It is urged that while results are far more important than methods, there is commonly a positive correlation between good methods and satisfactory results. Analyses of survey returns indicate the six factors of primary significance to be the training, ability, and productivity of the staff; time permitted or allotted to staff for research and for the direction of graduate work; facilities (laboratory, library, clerical, and laboratory assistance, and the like) available to staff and students; the training and character of the graduate student body; organization and supervision; and character of graduate offerings. Some of these are analyzed in detail.

PROBLEMS of organization and administration of graduate work in land-grant institutions are in some cases of peculiar interest. One of these problems is that of suitable co-ordination with the work of other state-supported educational institutions. In 26 states the land-grant fields are incorporated in the state universities. In 21 states, the land-grant school is separate from the state university, and many problems have arisen in the development of graduate work at the two institutions. The various devices, satisfactory and unsatisfactory for avoiding duplication are noted. The principle of major lines as a method of preventing wasteful duplication by the state institutions is again emphasized.

> From the standpoint of graduate work [for states with separate land-grant institutions and state universities] it may be phrased as follows: (1) In graduate development the two institutions should be regarded as co-ordinate parts of the university system of the State; (2) in general the major land-grant fields previously enumerated should be developed at the land-grant institutions. Specifically wherever undergraduate colleges of engineering, home economics, agriculture, teacher training, and veterinary medicine are located in land-grant institutions graduate work in these fields, if developed at all, should be developed at the same institutions; (3) it must be clearly recognized that graduate work in the technical and professional fields already noted can not be developed satisfactorily in any institution which is severely limited as to its graduate work in the sciences. Reasonable interinstitutional understandings are possible which will prevent serious duplication and in some cases the well-developed offerings of each institution may be made to serve the needs of students in the others; (4) In general there should be some functioning interinstitutional faculty committee constituted to consider problems of duplication or overlapping in the graduate field. Possibly in some cases final authority with reference to any field represented in both institutions might well be vested in a joint graduate committee.[11]

Apparently in some institutions, there is a lack of co-ordination between undergraduate technical curriculums and the requirements of satisfactory graduate work in such fields. It is

[11] *Ibid.*, pp. 747–48.

argued that it should be an important function of every senior college (upper division) undergraduate curriculum to fit the capable student to enter upon graduate work in the field of his major without undue handicap. Any undergraduate curriculum so planned as to make impossible the acquisition by the more promising students of a reading knowledge of at least one foreign language is sacrificing the best interests of such students. It is suggested that land-grant institutions which indicate preparation for entrance to the graduate school as one among the objectives of undergraduate curricula should definitely outline sequences to be pursued by those who expect to enter upon graduate work.[12]

The rapid increase in demand for graduate work in land-grant fields is throwing increasing responsibilities upon executive officers and committees charged with duties of graduate administration. Without exception undergraduate work in land-grant fields is offered in every institution offering graduate work in these same fields. There is pressure upon staffs to offer graduate work. When should it be permitted?

Every graduate school should work out a satisfactory technique for determining whether a department or division is satisfactorily equipped and staffed to offer graduate work. This should include a survey of academic and other preparation of the members of the staff. Particular attention should be paid to the library facilities. Methods for determining whether or not library facilities are adequate for any given field have been developed and should be applied. Not infrequently valuable assistance in such evaluation may come to an institution by bringing in someone who has ability and standing in the particular fields in question and who can give a frank and unbiased opinion as to the standards of work in a particular department or field.[13]

Particular emphasis is laid upon the responsibilities of the Association of Land-Grant Colleges and Universities with reference to guidance of graduate development. It is suggested that provision be made for regular conferences on graduate work, or for the creation of a section of the Association directed primarily to the consideration of graduate problems, and that this might well take the form of an annual or biennial meeting of those in responsible charge of the administration of the land-grant graduate schools.

[12] *Op. cit.*, p. 834.

[13] *Ibid.*, p. 835.

Financial Stewardship

By EDWARD A. FITZPATRICK

The Need of a Sense of Stewardship in Dispensing the Funds of Many Catholic Colleges

IT MAY seem strange to discuss the question of the stewardship of funds on the part of the Catholic colleges. A wag might suggest that there was not anything to be steward of. Money comes in and money goes out, nobody is richer personally, and everybody is worrying about the debt whether bonded or current. There is never enough money. But the wag with his iota of truth should not succeed in preventing the consideration of the question, because there is a serious problem underlying it, though for some reason or other the question seems to have been avoided.

The problem needs to be considered particularly at this time for a number of reasons. The first among these is the extraordinary increase in the cost of higher education, including the cost of lay faculty members as well as of building and equipment. Second, there is the false assumption which is prevalent in local communities in which Catholic colleges are located that the religious orders are reeking in money. Or else the naïve ask, "How could they build such magnificent buildings?" Also, many Catholic colleges are in dire need of funds not for expansion but for operation, to pay anything like a living wage for teachers. The too rapid turnover of personnel in Catholic colleges is the sure index of this condition.

Fourth, because in certain cases, rare perhaps, there has been some suspicion that funds intended for endowment have been "dumped" into operating funds and spent for current expenses, and obligations are assumed for future generations without an adequate means of meeting them.

Also, there is an increasing number of wealthy Catholics—approximating the millionaire class even—who are able to give, even though for the present they are untrained in giving, are without the motive of public service, are unimaginative so far as the less obvious, constructive, and preventive social services are concerned. They see the need for aiding the sick through a hospital, and they think $500 a munificent gift. That is the extent of their vision.

Last, Catholic colleges and universities do not now render to the public generally or regularly, or in most cases, at all, a statement of their finances or an account of stewardship.

Such being the need for a more frank recognition of stewardship for funds on the part of Catholic colleges,

what is the opportunity? With an increasing number of Catholics able to contribute, there is a genuine opportunity to educate them progressively on conditions and needs and ways of co-operating in the great work of Catholic education.

One point needs to be emphasized in a preliminary way, namely, that the aim of the publicity should not be directed primarily to the millionaire group, for social reasons as well as for financial. The possibility of a multiplicity of smaller gifts is more real than a windfall of great sums. It is a safer condition for continuity of service and for personal interest in the college beyond financial contribution, and it is a much sounder position from the social-welfare point of view.

A campaign of education is bound to result in increased gifts to Catholic colleges. What points should such a campaign aim to secure among potential givers? It should aim to impress potential givers and the public generally so far as it is interested: (1) that existing methods of administration and present policies are guaranties that present funds are being used with utmost economy in expenditure and the greatest efficiency in service; (2) that for all funds given to the college there is an adequate record of the gift, evidence of the inviolability of the principal, its wise investment and scrupulous application of the income to the specific purpose for which the gift was made; (3) that any program of expansion of the college is based on adequate survey of needs arranged on a basis of intelligent priority, together with a well-considered plan for carrying into effect without reference to mere institutional completeness, or foolish competitive institutional rivalry, or for even more extraneous reasons that might be mentioned; and (4) that for any specific suggestion a donor may make, provided the institution wants to accept it (and it should have the courage to refuse real money for specific purposes which it does not wish to undertake, or for which the proposed financing is inadequate), the university or college should be prepared with the experience of other universities, the nature of machinery to be set up and personnel to carry it out, the availability of such personnel, the cost in operation and maintenance.

It is this sense of readiness and this sense of trusteeship that will inspire a confidence in many Catholic colleges that they do not have at present to the degree they should. The failure on their part is the failure of omission, not of commission. A high sense of trusteeship for funds does not always exist among institutions. The altogether admirable and high purpose of an institution and even the unimpeachable character of its personnel is no guaranty of its wise management of its trust funds.

IT MIGHT be suggestive to state the way "unprofitable" servants among Catholic institutions have handled gifts or endowments. It would be suggestive were it possible. The record for the most part does not exist, or is scattered whither no one knows. At any rate it is not available.

Consequently, it might be well to go for illustration as to the way trust funds are sometimes handled in

another field entirely, and to indicate the potential dangers to trust funds by reviewing the way "unprofitable" servants of the funds for the common schools of this country have reduced or dissipated them. Surely here is a trust that this American democracy must hold in a peculiar degree almost sacred. The history of the common-school funds as told by Swift is an amazing record of shortsightedness, bad management, waste, and even worse things. These funds were reduced in the following ways:

1. Property or land included in fund sold for less than real value
2. Deeds of property improperly recorded or not recorded at all
3. Property (land) sold but no records of proceeds
4. Bad loans
5. Mismanagement
6. Dishonest management
7. Absconding of school-fund officers or debt
8. Theft or embezzlement
9. Moneys due on principal not added
10. Moneys due on principal diverted
11. Losses by fire
12. Funds borrowed by state (namely, college)
13. Funds used for state (college) expenses
14. Funds used to pay state (college) indebtedness
15. Funds misappropriated by state (college)
16. Used for other purposes than those intended
17. Exchanged for state securities—indebtedness later repudiated
18. Fraudulent bonds
19. Depreciation of securities[1]

Such are the ways in which public funds have been wasted or reduced through negligence, mismanagement, or dishonesty of public officials. Fortunately, we have learned from that experience, and today, public funds are better and more securely managed.

Further suggestions as to dangers to trust funds may be gleaned from a study of the prohibitions in statutes relating to trust funds. Each prohibition is ordinarily the statutory record of an abuse. The civil statutes furnish an extensive list as do indeed the provisions of canon law in its rules regarding borrowing, investment, and related subjects for matters which require the approval of the Roman congregation.

Specific suggestions from college experience are contained in Trevor Arnett's *College and University Finance*, and he lists common errors:

1. Endowment funds are "invested" in the buildings and grounds of the college itself, which is obviously not productive of revenue.
2. Common stocks of doubtful value, sometimes of corporations in which the trustees are interested, are bought.
3. Loans are made to other institutions of the same denomination as the college, or even to the trustees and officers of the college, secured merely by a personal note.
4. Investments are not diversified.
5. Endowment funds are hypothecated for expansion purposes.
6. A lack of proper accounting fails to differentiate endowment cash from current cash and in consequence funds that are really awaiting reinvestment are paid out for current expenses without anybody knowing what was taking place.
7. Funds are accepted, subject to a higher annuity rate than the college can afford to pay.[2]

[1] Swift, F. H. *History of Public Permanent Common School Funds in the United States, 1795–1905.* New York: Henry Holt and Company, 1911. pp. 157–58.

[2] Arnett, Trevor. *College and University Finance.* New York: General Education Board, 1922. pp. 25–43.

It matters not that the losses, waste, or reduction of trust funds were, at times, the result of the best intentions of the world. The losses were just as real as if they were deliberate. It matters not that the losses were the results of incompetence or ignorance or just *naïveté*, even with the best intentions of the best-intentioned people in the world. So the problem is real, and the danger to trust funds is real, and wherever there is the slightest suspicion either through failure to report or of specific competence to manage, the sources of such funds are likely to be frozen. On the other hand, confidence in agencies through a long record of intelligent management and high sense of trusteeship will loosen such sources of funds.

A FIRST step in the building up of confidence in the stewardship of Catholic education is the correction of a glaring fault of present administration. The sense of public responsibility which is clearly upon those charged with the administration of colleges even though such colleges are not supported out of taxes does not find expression in periodic reporting to the college public and clientèle. The unmistakable acknowledgment of such public responsibility would be in an annual report which will discuss the substantive problems of higher education and the financial problems of the particular institution. The former I do not discuss because it is beside our immediate purpose, but I may refer you to President Butler, of Columbia University, for as good an illustration as can be found of this aspect of annual reporting. For the financial reporting I can give a good illustration in the annual reports of President Lowell, of Harvard.

Take the report for 1927–28 of the President of Harvard University which happens to be at hand. You can find almost anything you might conceivably want to know of the financial aspects of Harvard University. Take two items. Thirty-seven pages of fine type are given over to the $94,372,702.22 of investments of Harvard University. Of this amount $86,702,875.76 are endowment funds. Eighty pages of the same fine type are given over to the list of these funds. Looking over the list I note funds there established in 1643, 1670, 1696, 1701, 1713, and so on. What a high sense of trusteeship; what a continuing memorial to its donors! And for these old funds as well as for the funds of last year, whether there was $500 or $1,000,000 there is the same record:

1. Title
2. Date of establishment
3. Principal
4. Receipts during the year
5. Expenditures
6. Present principal

Here you have the essentials:

1. The name of fund, or of giver, or of person in whose memory it was established
2. The date of establishment
3. A statement of the amount of the principal of each fund
4. The stocks or bonds or property in which the principal is invested
5. The amount of income from each stock, bond or mortgage during the current year
6. The purpose for which the income was used

The existence of boards of laymen in connection with the business administration of Catholic colleges and universities offers a second opportunity for building up confidence in the stewardship of Catholic colleges. If the right men are appointed it will do no good to just have them as decorations. It will do no good either if the old fear of the layman results in keeping these men in the dark or they receive less than the fullest knowledge of the college or university. It will do no good either to waste their time on routine. They must be continuously and progressively informed on the university. They must have some sense of actual responsibility. They must grow in knowledge, in interest, in active leadership.

This step perhaps should precede the first one stated. This small but representative group should furnish the schooling of the college executive in his job. These men serve the same purpose the English Parliament did in the early days for the English king. They are representatives of the entire public. They are given the information which the whole public would be given were it feasible. Presumably their reaction is the reaction of the public if it were possessed of all the information. Consequently their reaction is the guide to the public information to be progressively promulgated. Their inquiries will be the public inquiries; their reactions to proposals will be the public reactions; their support is what the public support will ultimately be. Nothing will save a college executive so much from himself and dry rot as an alert, inquiring, and intelligent administrative board, which is no rubber stamp, and whose members grow in responsibility and leadership.

Seniors as Counselors

By J. E. WALTERS

Seniors Proved Effective Counselors for Freshmen Delinquent in Scholarship

WE OFTEN hear that only experienced and trained counselors can actualize effective personnel adjustments of college students. This is probably true with some students, but with the average undergraduate who is delinquent in scholarship this is not necessarily the case. The gap between the experienced counselor or teacher and the student is large. As a rule they do not live mentally or socially upon the same level, but to a certain extent they live in different worlds. This is not the case, however, with the college Senior and the Freshman.

Many educators emphasize that more dignity and responsibility should be given to the student. President Wilkins, of Oberlin College, has particularly mentioned this,[1] and Mr. Little, former president of the University of Michigan, insists that as industry has given more responsibility to the worker, business to the customer, politicians to the voter, so must the college in the future give more responsibility to the student.[2] With these ideas in mind an attempt was made at Purdue University to discover if effective personnel counseling of Freshmen could be accomplished by Seniors. The purpose of the project was to reduce scholastic mortality among the Freshmen, as well as to help each student to make a better adjustment to his college life and work.

Five Seniors, each of whom had a good scholarship record, a pleasing personality, excellent health, and fine social environment, were chosen to act as personnel counselors for the members of the freshman class, who at the end of the first eight weeks of school happened to be delinquent in scholarship in the School of Mechanical Engineering in 1929–30. The 220 delinquent Freshmen were divided into two groups by random sampling. One-half of them were counseled by the Seniors who used definite procedures, and the other half were left to progress as in previous years. These latter constituted the control group. Each senior counselor was assigned 20 Freshmen, and a letter was written by the Personnel Director to each Freshman assigning the Senior as his personnel counselor. This letter requested the Freshman's co-operation and emphasized that the upper class-

[1] Kelly, R. L., ed. *The Effective College.* New York: Association of American Colleges. 1928. pp. 71–79.

[2] Little, C. C. *The Awakening College.* New York: W. W. Norton and Company. 1930.

man could offer valuable assistance and would be interested in his welfare. The whole plan was presented to him as a co-operative affair for his own good.

The Seniors were given instructions in the personnel methods of interviewing, analysis of records, the use and preparation of time schedules, and guidance with special reference to mental, physical, moral, and social development. An interview blank was devised, and duplicates of the personnel records of the delinquent Freshmen were made. Each Senior counselor was given the detailed personnel records of the men assigned to him. These records contained general personnel information, personality ratings, intelligence-test scores, health rating, and the other pertinent information.

After a study of the records of the men in his group, each counselor made an appointment to meet each Freshman in his room to see the boy's surroundings and living conditions, and to talk to him on his own grounds. During the first interview the counselor attempted to find the reasons to which the student attributed his delinquency and endeavored to formulate his own opinion of the causes. The Freshman was asked to make a "time study" of his time for the next week so that he might determine whether or not he was using his time effectively. At the end of the week the counselor met the Freshman for discussion of the time schedule, his progress during the week, and any further developments. Weekly meetings of this sort were arranged throughout the semester. In general, assistance was given or a follow-up procedure was planned. In addition, while these conferences between the Freshman and Seniors were going on further instructions in how to study, in mental progress, and in use of time were given to the counselors.

THE counseling procedure continued during the second semester, and at the end of the first eight weeks of the second semester the amount of delinquency of the counseled group was compared to the control group. The delinquency in the counseled group had decreased 34 per cent, while that of the control group had fallen only 13 per cent, a net saving of 21 per cent.

This saving amounted to 4.6 complete courses for the semester, that is, the complete work of 4.6 students for one semester. If the cost of educating a student one year be placed at $385, or $192.50 per semester, the annual saving to the University would have been $891. The Seniors served without cost, but had they been paid $.35 per hour, the prevailing student rate, for their work, the total cost would have been $77. If a saving of $891 resulted from a possible expenditure of $77, it would seem that senior counselors for Freshmen is a commendable business proposition for the University.

This plan also facilitates the measuring of the effectiveness of each counselor. For example, Counselor A decreased delinquency in his group 40 per cent; Counselor B, 39 per cent; Counselor C, 25 per cent; Counselor D, 15 per cent; Counselor E, 43 per cent; these measures were dependent

upon the time spent in the counseling, the personality, and the interest of the counselor.

The Freshmen on their part reacted favorably as a rule to the advice and suggestions from senior counselors. We found that the administration of personnel principles to the Freshmen should be forceful and thorough. Too much leniency resulted in ineffectiveness. Not only was there a large financial saving to the University, but this plan of student counselors resulted in a large increase in freshman efficiency. Because of the results reported here a large counseling program was put into effect at Purdue University for 1930–31. [Vol. II, No. 8]

A Suggested Report Form

By ALONZO G. GRACE

EDUCATION should always mean the development of the individual to fit his environment. In order to meet this ideal, individuals must be considered rather than groups. Certificates and diplomas must become incidental features of education rather than the primary objectives of both the educator and the student. Not how many shall have graduated but how many shall have been carefully examined, treated, and returned to a society which they accept and which accepts them, shall be the basis for higher education. Such a process of clinical education should involve a thorough diagnosis of each individual as well as the breaking up of subject-matter into units to meet differences in individuals, the preparation of various curriculums to meet a variety of interests and abilities, the development of a marking system that will measure individuals more accurately, and the sorting out of those with special ability for special recognition and training.

The following plan is suggested as a means of eliminating the subjective element in marking, and, likewise, as a means of more adequate recognition of individual abilities. Each subject should be broken up into units at the completion of which objective tests should be given. By objective tests are meant completion, matching, multiple-choice, true-false, selection tests, or variations of these. These should be prepared by the head of the department and the instructors concerned. It is obvious that the same form should not be used continuously. An objective test should be given upon the completion of the work of each semester. The instructor should keep a record of the score of each student made on each test and on the semester test. The total points to be scored on a semester test should equal the sum of the combined unit tests. These are administrative matters for the head of the department to work out with the instructors. The form in Table I should be completed by each in-

structor. The original should be sent to the registrar's office and a duplicate copy kept by the instructor.

The scores given in Table I are those for a portion of one group in Freshman English in a college in which there were twenty sections in rhetoric. The work of the first semester was conveniently divided into ten units. The instructor of each class gave the same unit test upon the completion of the unit involved, and upon completion of the semester, gave the semester test covering the course. The instructors had agreed upon the principal points to be covered and the amount of material to be included in the unit tests. There were twenty items in each test. The semester test included 200 items. The gross score equaled the sum of the scores on the unit tests plus the score on the semester test.

In the registrar's office the names of the students in the twenty sections of Freshman English were arranged in the order of their respective scores. In addition to the information just given the registrar's office determined the following facts for each student's record: his percentile score in the department, his position in the department, and his total honor points.

The honor points by this scheme are distributed according to percentile ranks in the following fashion:

	Honor Points per Credit-Hour
90th-percentile	5
80th-percentile	4
70th-percentile	3
60th-percentile	2
50th-percentile	1
40th-percentile	½
30th-percentile	0
20th-percentile	—1
10th-percentile	—2

The position in the graduating class may be determined by total honor points gained by this plan. Students in the 90th-percentile will be graduated with highest honors, those in the 80th-percentile with high honors, and those in the 70th-percentile with honors.

Each candidate for a diploma should be given a final comprehensive written examination over his entire college course, one semester prior to graduation, using objective tests.

The advantages of this plan are primarily that it eliminates subjectivity in marking, takes the burden of passing or failing a student off the shoulders of the instructor, consolidates all marking processes in the registrar's office. It should be borne in mind that a system such as the one

TABLE I

METHOD OF RECORDING SCORES

Name	Crude Score in Unit Test					Semester Test	Gross	Position in Class
	1	2	.....[a]	9	10			
Adams, Ruth	20	19	.....	17	18	190	375	2
Boswell, John	10	11	.....	7	10	100	198	4
Cesare, Alfred	19	18	.....	19	20	190	380	1
Johnson, Arthur	18	10	.....	20	20	180	373	3
Shepard, John	8	7	.....	7	8	104	177	5
Zali, Jeanne	5	9	.....	12	10	58	169	6

[a] Because of lack of space Columns 3 to 8 have been omitted.

herein suggested is workable mainly in undergraduate courses. The selective process will have had such a refining influence that graduate courses should not be considered. Every student entering the graduate school, however, should be given a general comprehensive examination to ascertain whether or not he is qualified to continue with graduate study.

[Vol. II, No. 8]

· *With the* · Technicians ·

An attempt to discover the relation between scholastic or extra-curricular achievement and vocational success of Wesleyan alumni is recounted by T. A. Langlie and Ashton Eldredge, writing on "Achievement in College and in Later Life," in the *Personnel Journal*. For this study the three highest and the three lowest in both scholarship and activities in each class from 1897 to 1916 were selected. Their vocational achievements were rated by 25 of their classmates. On the basis of the information thus gathered the authors decided that there was little correlation. Of the two groups, the high-scholarship group led the list selected for collegiate activities. The smallness of the study and the extreme quality of the student selected for study impair the value of any conclusions reached.

Philanthropy

Darell Boyd Harmon, of the School of Education, New York University, is the author of "Some Trends in Financing Higher Education," published in *Social Science* for April. The study traces some of the trends in philanthropy in American higher education in an attempt to learn the extent of its influence and predict the future influence of endowments. Privately endowed institutions depend upon philanthropic sources for 42 per cent of their current expenses, in addition to being indebted to donors for much of the property and equipment they employ. Competition is increasing—the institution which seeks gifts must be ready, able, and willing to meet certain standards and requirements. The large contributor frequently turns to the educational foundation for guidance in his gift-giving. The road seems to lead to improvement, for, since existence depends so largely upon outside aid, high standards will be necessary for recommendation in philanthropic assistance.

College Teaching

The old strongly intrenched belief that a man who knew a subject could teach it is being challenged today both by critics of educational procedures and by the profession itself. Professional training for teachers in elementary and high schools has reached a new level during the century. Has there been much done to train college teachers? This is the query of Harry N. Wright, who has contributed "The Improvement of College Teaching" to *Social Science*.

Recognizing, of course, the differences which the maturity of the students indicates, yet does not the college professor need something besides subject-matter to make him a real teacher? The Association of American Colleges has asserted that to say that a college teacher needs no particular training or is incapable of any spe-

cial instruction in methods of teaching is just as ridiculous as to say that the painter, the sculptor, the musician or the actor needs no instruction or training in the technique of his profession.

Charging that colleges are no longer institutions of purely higher education, this writer intimates that they are crowded on the lower level into becoming a phase of secondary education and at the top into research. Advancements, he says, are not on the basis of good teaching, but on research contributions. Mr. Wright, however, optimistically avers that the "spirit of progress is working up from the lower grades." He cites experiments at Wisconsin, Swarthmore, Harvard, and Rollins and commends other institutions for the maintenance of permanent divisions of research in teaching and personnel work.

Leaves of absence, traveling expenses to make outside contacts possible, conferences, addresses by educational experts, possible observation and criticism by other teachers, library facilities in professional literature, mechanical aids to instruction, faculty personnel service, improvement of living conditions, possible ratings by students are suggested as means of improvements for teachers in service.

Reorganization of the graduate school is the key to the improvement for teachers yet in training. The basic factor is to be love of teaching, exemplified by the professors in the graduate school. Research and subject-matter are to be regarded as mere tools. Second, Mr. Wright emphasizes the value of scholarship, and as a third factor, broadening of the whole field of knowledge. The final requirement is professional training, calling again for a new attitude on the part of the graduate school. Assistantships to be regarded as practice teaching are suggested.

Since all of this will lengthen the period of training, Mr. Wright decides we must be content with, or rather encouraged by, activity in the colleges themselves.

Student selection, with an especial consideration of the vocational point of view, is presented by Dean J. B. Johnston, of Minnesota, in "Who Should Go to College?" an address given at the Vocational Guidance Association meeting last February and printed in the *Vocational Guidance Magazine*.

The methods of selecting college students must contribute to the vocational guidance of all secondary school pupils. While encouraging college attendance on the part of those who are fitted for it, the selective processes must also help the unfitted to understand that fact and to find their proper places in society.

Young Matriculants

Interesting data and attitudes are revealed in the recent study, *Some Factors in the Careers of Young College Students* (Teachers College, Columbia University, Contributions to Education, No. 437) made by Howard A. Gray. In an attempt to discover the social, intellectual, and economic status and problems of the youths who enter Columbia University and Barnard College at an unusually early age, Mr. Gray has made this compre-

hensive research. He first surveyed the literature in the field, then studied the reactions of both college authorities and the people who, themselves, had entered at an unusual age, made a detailed study of the individual records of 126 boys and 28 girls who entered these two institutions before the age of sixteen years, during the five-year period from 1921 to 1925.

Realizing that the student body of Columbia and Barnard is not typical, nevertheless the author does conclude that his findings will be of significance to educators in general. Concurring with the actual findings, that there is an inverse correlation between age and intelligence-test achievement, educators believe that young gifted students should be admitted, and declare that there are no educational and vocational handicaps, although they admit the possibility of social maladjustment. Although Columbia University sets sixteen years as the minimum age, and Barnard fifteen, the requirement is waived if the student seems mentally and socially mature.

The groups studied constituted 4.1 per cent and 2.6 per cent, respectively, of the Freshmen at Columbia and Barnard during these years studied. The mean age for this group of "young" students was fifteen years and six months. The average college Freshman is eighteen years and seven months of age. The group of young students is largely of foreign parentage, many being Russian and Jewish stock. They were from comparatively small families, and about one-fourth had at least one parent who had been a college student. Both groups were above the social level of the typical American undergraduate. One-third of the boys and one-half of the girls were partially self-supporting. The younger boys showed a median intelligence-test ranking definitely higher than the normal-age male students; the girls were higher, but not to such a marked degree, although this may in part be explained by the fact that the small number of cases for girls makes the validity of the results less than for the male students in the experiment.

A smaller proportion were from private schools than the general student body. Four-fifths of these young students completed their undergraduate work in eight semesters or less, which is better than the general record. Contrasted to 8 per cent of general men students, and 10 per cent of women students, 16 per cent and 21 per cent, respectively, of the young students were elected to Phi Beta Kappa. According to the Baldwin and Wood Tables for Boys and Girls of School Age, the deviations from normal weight and height were less (above average) than the older students. The younger group was found to be more prominent in extra-curricular activities than the older students.

An interesting part of the study is the attitude taken by the young students themselves. One-fifth of the boys and one-quarter of the girls believed the young college student needs to establish certain habits of thought and work; about the same number believed the superior student neglected by his parents and the college. About one-eighth believed that the younger student should wait until more mature socially to matriculate,

and one-sixth decided that the young student was handicapped in the economic order.

As the result of the experiments recounted here, it was determined that the best single criterion for the prediction of scholastic success was the intelligence-test score. The investigator recommends that no arbitrary age-limits be set, pleading that the student who has reached college in spite of extreme youth is there because of intellectual fitness, and begging that educators do not hamper him.

The Students

A statistical definition of a "national university" has been evolved by C. R. Foster and Paul S. Dwyer in *A Study of the Geographic Distribution of Students in Three Hundred Sixty-three American Colleges and Universities* published recently by Rutgers University. This definition comprises the following elements:

1. Three-fourths, or 37, of all the states and the District of Columbia, represented.
2. All of the nine geographic districts represented.
3. An index number less than 13.5.
4. Fewer than 30 [per cent] of the students from the home state.

The index number was computed by determining the variations of the percentages of students coming from each of the nine geographic districts of the United States in relation to the percentages of the total population found in these districts according to the *United States Census for 1920*.

The national institutions in the order of increasing indexes are Antioch, Asbury, Sweetbriar, Washington and Lee, Wellesley, Georgetown, Smith, Yale, Dartmouth, and Notre Dame. The criteria for the three other classifications determined by these collaborators are:

"Intersectional":
1. At least two districts from which the college draws *more* than the census percentage.
2. An index number of less than 20.0.
3. Less than 40 [per cent] of the students from the home state.

"Sectional":
1. All institutions not in the first two classes, with fewer than 50 [per cent] of their students from the home state.

"State":
1. All remaining institutions, or those with 50 [per cent] or more of their students from the home state.

In *A Study of the Class Entering Purdue University in 1926* H. H. Remmers and J. M. Stalnaker found that of the 1,126 matriculants the 29 per cent graduated in 1930 were superior to the 14 per cent still in the University. These were superior to the 46 per cent who had withdrawn from the University, and they, in their turn, were superior to the 11 per cent dropped by the University. Twenty-eight items, including such unusual information as size of the high school the student attended, the environment of his home, his vocational preference, the number of his brothers and sisters, were considered in this appraisal.

Probation and threatened withdrawal have proved effective means of raising the scholarship standards of students who have entered the College of Engineering, University of

Michigan, with insufficient preparation. The percentage of deficiency increased during the three year-periods summarized by L. W. Keeler in *An Investigation of the Effect of Subject Deficiencies upon Accomplishment of Students Entering the College of Engineering of the University of Michigan during the Academic Years, 1927–28, 1928–29, 1929–30*, a pamphlet published by the Bureau of Educational Reference and Research, University of Michigan. The collective deficiency in trigonometry, geometry, and algebra is greater than in all the other subjects combined. The difference between class work of the students with deficient records at entrance and those not deficient is negligible during the first three semesters. After the third semester the accomplishment of students not handicapped at matriculation is slightly higher than that of students with deficient preparation.

Tuition Fees

A comparison of the curve of general business index with the growth of total tuition incomes of representative universities and colleges is graphically shown by Roy W. Elliott in his article "Fee Statistics and Trends" and chart in the *Minutes of the Twenty-first Annual Meeting of the Association of University and College Business Officers.*

Following the slump of 1920–21 most institutions continue on the upgrade with, however, a marked falling or flattening out of practically all of the curves a year later. . . . This, in effect, proves the contention that students return to school during the beginning of a depression but that in many instances after business improves they drop out of school to return to work, or quit because the back-wash of depression has just reached them. The local institutions apparently thrive during these periods since students financially unable to attend state institutions at some distance, go to those nearer home.

The experience of the next few years in the light of this chart should tell much, and may give a fairly definite basis for forecasting tuition income from business conditions.

A pamphlet, *College Tuition Fees*, by Philip A. Cowen, printed in the University of the State of New York Bulletin, No. 941, also considers the elevation in tuition fees during the postwar depression, with particular reference to its effect on public colleges as contrasted to private colleges, endowed groups against non-endowed, women's colleges against men's, large colleges in contrast to small. The author warns against an increase in tuition not carefully considered in the light of such data as he has assembled.

In the case of a college of considerable resources an increase of tuition may result in a rather serious change in the character of the student body. If such an institution wishes to maintain among its students a fairly constant economic cross section of society and also desires to raise its tuition fee, some means must be found to compensate for the disturbing influence of a higher economic standard. Scholarships and loan funds have been employed to alleviate this difficulty in certain instances.

An increase of tuition may have a distinct relation to the purpose for which an institution exists, and herein there should be no inconsistency. If the purpose demands a relatively free educational oppor-

tunity the means should be obtained for that achievement. On the other hand, if the payment of the cost of education by the student does not produce a situation which is inconsistent with the institutional purpose there may be no harm in charging students the cost of their education.

The present means of solving private college financial problems, namely, by economy, by the increase of endowment funds, and by an increase of tuition charges, may all be carried to their practical extremes and still some colleges may operate with an annual deficit. For those it may be necessary to work out additional steps to alleviate their financial condition.

Marks

That absences tend to accompany low marks, that there is little difference in the absence records of Freshmen and Sophomores, that fraternity men cut more classes than non-fraternity members, that those with high marks have fewer absences than those of equal percentile rank with low marks are the conclusions drawn by Lonzo Jones, who describes an experiment at the University of Iowa for *School and Society*. The days of terminal morals for printed matter are not over, or even numbered, when researchers can unearth such satisfying reward-for-the-righteous, scoff-for-the-sinners data as these.

The rewards are not all immediate, for questionnaires sent to members of the graduating classes of Harvard Graduate School of Business Administration from 1920 to 1925 showed that the men who had high marks in the school are the ones who are earning high salaries in the business world, according to the *Harvard Alumni Bulletin*.

Foreign Students

The great ball of red tape which must be unwound and kept untangled for the foreign students who come to the United States is well straightened out in *Foreign Students and the Immigration Laws of the United States*, a monograph of the Institute of International Education by Ruth Crawford Mitchell, chairman of the Committee on Foreign Students of the University of Pittsburgh. Since the World War the United States has replaced Germany as the mecca for foreign study. There are more students drawn from a wider range of nationalities studying in the educational institutions of the United States than in any other country in the world. The number of foreign students in any one institution continues comparatively small, and there are unfortunately few university officials who understand the implications and ramifications of the provisions of the immigration laws.

Failure to report the dropping-out of school of foreign students who are in the United States under the special student regulations may result in unfortunate conclusions for both the school and the student: removal from the approved list of colleges and universities, on the one hand, and deportation, on the other.

·The·Reporter·

In an article in the *Boston Evening Transcript* Harland R. Ratcliffe gives an interesting survey view of higher education in New England, of the opening of the 37 colleges and universities, and of the outstanding plans in educational circles. Harvard begins the year with the House Plan in full operation, after a year of experimentation. Colby and Norwich have launched ambitious endowment campaigns. Ground has been broken for the first permanent constructions on the campus of the new Bennington College. Wesleyan is preparing for its Centennial Celebration, and Rhode Island State has been engrossed in plans for the inauguration of a new president, Raymond G. Bressler.

Three considerations of the inescapable relations of secondary and higher education, each presenting a different attitude, have recently come to the attention of the Journal of Higher Education. "How Appropriately Are High School Graduates Making the College Decision?" is a summary of questionnaire information assembled by the *University of Pittsburgh School of Education Journal.* This discussion is concerned with the research problem alone, and allies itself strictly with neither high-school nor college problems. George O. Ferguson, Jr., writing on "Factors in Predicting College Success" for *Secondary Education in Virginia* (University of Virginia Record Extension Series, Vol. XV, No. 10), considers the high-school and college relationship in the light of rejection by the colleges of the high-school graduates whose secondary-school record does not seem to promise success in higher education. *Study of the Relations of Secondary and Higher Education in Pennsylvania,* a publication of the Carnegie Foundation for the Advancement of Teaching, in co-operation with the Joint Commission of the Association of Pennsylvania College Presidents and the State Department of Public Instruction, is principally concerned with offering solutions for the wise guidance of high-school pupils to the end that: the high school may be able to judge the pupil accurately, on the basis of real knowledge of background and complete school record and history; the school may guide the pupil who is seeking college preparation; the school may enrich the secondary education of the pupil who will not carry his educative efforts past that stage.

The Liberal Arts College Movement is sponsoring a radio program in co-operation with the National Broadcasting Company for Saturday, November 14. The purpose of the broadcasting is to stimulate more interest in the liberal-arts college. One part of the

program will include talks by President Hoover, Robert L. Kelly, Mrs. Thomas J. Preston, Jr., John H. Finley, and A. M. Ward. The second part of the program will be given over to college presidents in various communities who are working under the leadership of regional directors.

SPEAKING during the summer before the Conference of International Student Service at Mount Holyoke College, President William Allan Neilson, of Smith College, characterized the difference between American and European education in the following paragraphs:

To a superficial observer it is bound to bring out the apparent low level of our scholarship. If you take one man in 1,000 and send him to college in one country, and one man in 100 in another country and send him to college, it is quite clear that the average level of ability in the second college will be much lower than in the first. In your European colleges and universities—I do not refer to Oxford and Cambridge, but to universities in France and in other countries of Europe—the men there correspond not to our university population, but to the top 10 per cent of our university population.

Why do we have the other 90 per cent? Because of the efficiency of our educational institutions. If our colleges were made up of that top 10 per cent, they would make a better showing to the world. We are educating a grade of natural ability that is left in Europe to industrial occupations, to the minor clerical work, which can be engaged in without higher training. We do it because as a nation we believe in education—it may be said, naïvely and touchingly—but profoundly. We do it because we can afford it; because this vast middle-class feels in a great number of cases that it is richer in physical things than in intellectual things, and it wants to bring up its next generation so that these two things will be better balanced; so it sends its sons and daughters to college.

THE Federal Office of Education reports that a careful check of returns from 34,589 alumni and former students shows that 24,952, or 72 per cent, were self-supporting wholly or in part while they attended college, and that 9,637, or 28 per cent, depended upon their parents to defray the cost of their higher education.

IN HIS annual address to the faculty of Miami University at the opening of the current year, President A. H. Upham urged a reorganization of the prevailing system of higher education. He said in part:

Mass education is singing its swan song, and the theory that college is good for everybody will have to be abandoned. State supported colleges are facing the necessity of limiting enrollment to a more select group of high school graduates. Both for financial and intellectual reasons we must exclude the poorer student, who has no aptitude for intellectual pursuits.

Increased tuition for 2,200 students would increase Miami's income $44,000, while scholarships to 5 [per cent] of the student body would amount to about $12,000. The state would appropriate that much less to Miami, the deserving student would benefit, and everybody ought to be happy.

NORTHWESTERN UNIVERSITY this year is inaugurating a plan of alumni education in the form of a series of evening lectures for alumni living in and around Chicago. The lectures will be delivered by members of the

faculty, and include the following: "War Debts and Reparations and After Effects of the Treaty of Versailles," "Russia's Five-Year Plan," "Western European Relations and the Prospects of World Peace," "Political Ferment among the Yellow Races," "Political Conditions in South America as They Affect the Foreign Policy of the United States," and "Achievements of the League of Nations."

ALMOST 75 per cent of Vassar graduates in recent years marry. The average number of children per married alumna rose from 1.9 in the last decade of the past century to 2.2, fifteen years later. Infant mortality among children of Vassar alumnae, always low, dropped from an average of 25 in the years from 1895–1918 to 21 in the period 1909–28. Four-fifths of the married alumnae in the first quarter of this century chose college men for husbands; half, professional men. Larger families were found especially in the high-paid professions, next conspicuously in the college group as a whole. These are the statistics, summarized in Mabel Newcomer's article, "Marriages and Children of Vassar College Alumnae," which the *Vassar Quarterly* presents to answer the still persistent assertion that higher education for women is resulting in group suicide.

AN UNUSUAL publication has been presented by Pennsylvania State College in its recent *Abstracts of Studies in Education* (Penn State Studies in Education, Number 2). Theses accepted by the School of Education of the College which are of general interest are summarized and these abstracts edited to a standard two-page form which may be clipped from the bound volume and inserted in the *Loyola Educational Digest*.

Abstracts, in the conventional form, from the University of Colorado, the University of Southern California, University of Iowa, University of Minnesota, and Ohio State University have also recently been sent to the JOURNAL OF HIGHER EDUCATION. The number of academic institutions to employ this form of publication of their own students' contributions continues to grow.

AFTER a year and a half spent in thorough consideration of the English examinations, both restricted and comprehensive, which have been given by the College Entrance Examination Board, the Commission on English has presented its report. The history of the Board's English examinations is reviewed; procedures, aims, and objectives are summarized; correlations with freshman achievements are considered; questionnaire answers are discussed; and many findings are presented from the summary of information obtained. The Harvard University Press has published the complete report as Volume XVII in the series of "Harvard Studies in Education."

BECAUSE of the depression many students are in financial difficulties, and this fact has been recognized by President Hoover's Committee on Unem-

ployment Relief. Fred C. Croxton, assistant director of the relief work has recently given out the following list of organizations which are prepared to lend funds to students:

American Association of University Women, national headquarters, 1634 I Street, N. W., Washington

F. J. Barrett Foundation, 1600 Davison Avenue, East Detroit, Michigan

Business and Professional Women's Clubs, National Federation, 1819 Broadway, New York City

Crawford Student Loan Fund, care of United States National Bank, Portland, Oregon

Harmon Foundation (Inc.), Division of Student Loans, 140 Nassau Street, New York City

Hebrew Free Loan Society, 108 Second Avenue, New York City

Kiwanis International, 520 North Michigan Avenue, Chicago

Knights Templar Educational Foundation (applications for loans should be made to the grand recorder of the Grand Commandary, Knights Templar Educational Foundation, in the respective states)

Lions International, 332 South Michigan Avenue, Chicago

National Congress of Parents and Teachers, 1201 Sixteenth Street, N. W., Washington

Panhellenic-National Panhellenic Congress, care of Miss Louise Leonard, 150 Claremont Avenue, New York City

Rotary International, 211 West Wacker Drive, Chicago

State Federations of Women's Clubs, 1734 N. Street, Washington

Young Men's Christian Association, 347 Madison Avenue, New York

A WEEKLY program of radio addresses on present-day economy and psychology was inaugurated on October 17 by President Nicholas Murray Butler, of Columbia University; President James R. Angell, of Yale University; and Mr. Ernest L. Bogart, president of the American Economic Association. These programs are sponsored by the National Advisory Council on Radio in Education and broadcast through the courtesy of the National Broadcasting Company. The following lectures are scheduled:

ECONOMICS SERIES

October 17
Forerunners of the present depression, by Ernest L. Bogart, of the University of Illinois and president of the American Economic Association

October 24
International economic interdependence, Edwin F. Gay, professor of economic history, Harvard University

October 31
America and the balance sheet of Europe, Harold G. Moutlon, Brookings Institution

November 7
Social consequences of business depressions, Jane Addams, Hull House

November 14
Effects of depression upon employment and wages, William Leiserson, Antioch College

November 21
Business depressions and business profits, William F. Gephart, St. Louis

November 28
Agriculture in relation to economic recovery, Edwin G. Nourse, Brookings Institution

December 5
Wages in relation to economic recovery, Leo Wolman, Columbia University

December 12
Banking policies in relation to recovery, Jacob H. Hollander, Johns Hopkins University
December 19
Forward planning of public works, Otto T. Mallery, Philadelphia

PSYCHOLOGY SERIES
INTRODUCTORY TOPICS

October 17
Psychology today, its relations to other sciences and to social problems, by James R. Angell, president of Yale University
October 24
Psychology, a modern science of human management, self-understanding, and social control, by Walter R. Miles, president of the American Psychological Association
October 31
Learning and forgetting: some recent discoveries, by Edward S. Robinson, professor of psychology, Yale University
November 7
Our social attitudes: convictions and prejudices, their origin, and control, by Gardner Murphy, professor of psychology, Columbia University
November 14
Current trends in psychology: the middle road between behaviorism, psychoanalysis, and other schools, by Robert S. Woodworth, president of the Social Science Research Council

CHILD DEVELOPMENT

November 21
The development of the infant mind, by Arnold Gesell, director of the Clinic on Child Development, Yale University
November 28
Children's fears, by Harold F. Jones, Institute of Child Welfare, University of California
December 5
Anger, its causes and control, by Florence L. Goodenough, Institute of Child Welfare, University of Minnesota
December 12
Social behavior in infancy and childhood, by John E. Anderson, director, Institute of Child Welfare, University of Minnesota
December 19
Adolescence: the difficult age, by Leta S. Hollingsworth, Teachers College, Columbia University

The psychological series will consist of five units, later speakers to be announced. Other units will be educational psychology, changes in personality, animal behavior and industrial applications. The introductory unit was planned by Walter V. Bingham, Paul S. Achilles, and Arthur I. Gates. A subcommittee headed by John E. Anderson laid out the second unit. The initial economic series was arranged by a committee whose members were Harry W. Laidler, *chairman*; Felix Morley, *executive secretary*; Wesley C. Mitchell, H. G. Moutlon, E. G. Nourse, and Rexford C. Tugwell. The members of the Brookings Institution assisted.

·Editorial·Comments·

Fiscal Reflections

AS ANOTHER academic year begins, two stout and stubborn problems confront the colleges of universities: the sparsity of funds for carrying on long-established as well as newly developed programs and the glutted job market for recent graduates. While the world struggles doggedly but ineffectually in the grip of a gargantuan depression, there is little that anyone can do directly with either the one problem or the other. If the Hoover moratorium and half-million-dollar credit corporation or any other device succeeds in jacking up the industrial tractor out of the mire, the recovery of washed-out acres may not be difficult for the colleges, but if the depression continues indefinitely, as an occasional economist predicts, it seems inevitable that the entire map of higher education will be appreciably altered. Pending either of these eventualities, one turns to the financial history of the colleges for a review of the trends of recent decades.

During the twenty-two years between 1906 and 1928 the resources of American higher education multiplied in the neighborhood of four hundred per cent to keep pace with a similar multiplication of students from approximately 200,000 in 1906 to 868,793 in 1928. Just twenty-five years ago the United States Bureau of Education listed 622 universities and colleges with the following assets.

Buildings and grounds	$260,000,000
Productive endowments	250,000,000
Total assets	554,000,000

In 1928 the Bureau estimated the assets for the then existing 1,076 institutions of higher education to be.

Buildings and grounds	$1,300,000,000
Productive endowments	1,150,000,000
Total assets	2,400,000,000

Incomplete reports of registration this fall seem to indicate that although some private institutions are working with reduced numbers, most state institutions have filled or surpassed their quotas. Total registrations for most colleges and universities will more than likely be equal to that of last year, but everywhere budgets are down, and everywhere there is apprehension for next year when it is supposed that if the industrial situation continues as at present, registration in all institutions will be appreciably reduced.

ANY sizable decrease in registration will bring education into the same quagmire as industry. Colleges have expanded extensively to keep up with the demands of a growing public. A falling off in demand brought about by economic inability to pay tuitions will mean that many institutions will reduce the size of their staffs, that others will cut the salaries of those retained, and that still others will be forced out of existence entirely.

All varieties of colleges will suffer, but the small liberal-arts colleges, not

too well supported at best, seem due for the most serious assault. They will suffer not only from frozen and interest-lapsing securities, but also from appreciably reduced registration. The swing from these small institutions to the state universities is likely to be pronounced. Lower tuition fees will force many parents to send their children to publicly supported colleges even though they would prefer the more compact intellectual, religious, and social life of the denominational and quasi-denominational colleges. Similarly, public junior colleges will attract groups of students who under ordinary circumstances would have gone away to private colleges in their own or other states.

Meanwhile, both state universities and public junior colleges will do well to maintain their present numbers. Most students from the lower economic classes will be cut off entirely from opportunities for college work, and it is to be doubted whether the influx of students from areas heretofore served by the private colleges will be large enough to keep their numbers up to present standards.

The effects of any prolonged period of financial famine for the colleges must obviously be far-reaching. American society is predicated upon a democratic educational enterprise. Automobiles, radios, tractors, washing machines, and fine fabrics are not in general bought by the poorly educated classes. To reduce the number of college-trained people in the United States is equivalent to reducing the number of workers employed in satisfying their multitudinous economic wants. The number of books printed and sold, the number of ocean liners built and commissioned, the number of orange, grapefruit, and olive plantations in production, the number of physicians and lawyers in practice, these and many other economic activities lean heavily upon the college-trained portion of the population.

EDUCATORS as a class can do little in the present crisis except to keep the economic importance of education continuously in the thinking of their constituencies. From the point of view of the industrialist and the professional man education pays. Our political and industrial leaders must not be permitted to forget how well it pays. The effects of educated intelligence and educated attitudes ramify throughout our entire national life. To cut down the incomes of our educational institutions must serve to prolong the depression rather than to abbreviate it.

While the economic drought continues, the plight of large numbers of college-trained workers should not be overlooked. The labor unions have been rather successful in defending the living standards of skilled and unskilled laborers, and in this depression as in no previous period of stress, the laboring man has been comparatively well provided for. The so-called white-collar classes, on the other hand, unorganized and therefore unpublicized, have slid down noticeably on the economic ladder. They have taken large cuts in salary, they have been forced to take vacations without pay, and hundreds of thousands are without employment of any sort.

Among this latter group are many thousands of graduates of the years 1930 and 1931. Last spring the National Student Federation made a survey of 50 key industrial organizations to discover that universally the quota of college graduates to be employed this year had dropped alarmingly. And as in industry, so also in education. A recent query directed to the teacher-placement departments of the universities in the Middle West brought the discouraging information that every other June graduate seeking a teaching position is still unplaced. We are not only oversupplied with wheat, coffee, cotton, and steel, but also with college graduates.

THE present situation presents the occasion to investigate carefully the entire problem of the place of the college man and woman in our economic structure. A jammed industrial machine has brought about a temporary condition, but the constant multiplication of college graduates will in time make the condition chronic. When the supply outnumbers the demand, what are we going to do with our college graduates? The economic machine needs their purchasing power but apparently not their services. Already we have reached that condition in the field of teaching. In time we shall have the same problem with engineers, physicians, lawyers, dentists, agricultural workers, graduates of colleges of arts, colleges of commerce, and perhaps even divinity schools.

Writing in this JOURNAL last year Harold F. Clark, of Columbia University, summarized the situation. He urged that careful and long-time supply-and-demand studies be undertaken pointing toward state educational planning.[1]

Mr. Clark wrote his article before the present slump began. The situation is more acute now. It would be a service of incalculable value if some large state university would take advantage of the opportunity presented by the present emergency to raise funds for the investigations Mr. Clark proposes. If the studies are not begun soon, we shall before many years be engulfed in a deluge of overproduction, the effects of which may be overwhelming.

The University Library

INDIRECTLY but significantly related to the economic situation is the article we are publishing this month from the pen of Charles Harvey Brown, of Iowa State College. Mr. Brown has made a study of the mounting costs of German scientific periodicals. Unless some such ameliorative scheme as he proposes is adopted, it looks seriously as though many professors and students will be deprived of reports in their sciences from the German laboratories. Such a development would be a most serious deterrent to American science. We are happy to bring Mr. Brown's facts to the attention of our readers.

The publication of Mr. Brown's article together with the inauguration this year of a university journal devoted to research in library problems[2]

[1] "The Economic Effects of Education," JOURNAL OF HIGHER EDUCATION, I (March, 1930), p. 147.

[2] *The Library Quarterly* published by University of Chicago Press.

presents an opportunity briefly to review the development of American college and university libraries. Mr. Flexner in his recent and much discussed book describes the university library of the post-civil-war decades as small, understaffed, and poverty-stricken:

> Half a century ago, roughly speaking, America was practically without libraries. It is less than sixty years since Daniel C. Gilman, destined soon to be president of Johns Hopkins University, resigned the librarianship of Yale University, because he could not obtain an assistant and had himself to light the fire in the stove every morning.[3]

Contrast such a situation with the present library facilities at Yale. So spacious, so well appointed, so luxurious is the new Sterling Memorial Library at New Haven that members of the faculty, it is alleged, must occasionally remind students and the public that the books constitute the library. It is reported that Professor Chauncey Tinker interrupted a guest in his rhapsodic enthusiasm to remark, "My dear sir, this is not the Yale Library. The library is inside."

While beautiful library buildings are being built, the innards are not being neglected. Writing last month in *The New York Times*, President MacCracken of Vassar compared European and American university libraries much to the advantage of our cisatlantic institution. Some of his observations were these:

If we compare the library budget of Edinburgh University with that for Vassar College, we find that the percentage of library expenditure to the total budget at the American college is double that for the largest Scottish university library.

It is obvious that in three important features, adequacy of material equipment, library service to students, and maintenance of current literary supplies, the British and Continental university must be greatly handicapped as compared with the American college.

Compare the great Bodleian Library at Oxford with an American college library. From one point of view, it is true, no comparison is possible. The treasures of the Bodleian in manuscript and printed rarities, in oriental, classical, and other areas are priceless and inexhaustible. These are for the specialist, but for the undergraduate, comprising three-fourths of Oxford students, these are beyond his ken. As against a chair and desk space for two-thirds of the student body at Vassar, the Bodleian provides one for about one-thirtieth of that number. As against all day and evening service, the Bodleian is open about one-half as long. No admission to the shelves, no general loan system, no adequate foreign-book or periodical service is afforded.[4]

The United States Bureau of Education reported a national expenditure in 1906 for libraries and scientific apparatus of $45,000,000. This amount jumped to $245,000,000 in 1928. If universities are collections of books, as Carlyle observed, then American higher education is striding forward. Unfortunately, the depression may delay the march. W. H. C.

[3] Flexner, Abraham. *Universities: America, English, German*, p. 76.

[4] MacCracken, H. N. *The New York Times*. September 13, 1931.

··Reviews··

A Thought-Provoking Book

CREATIVE MIND, *by C. Spearman.* New York: D. Appleton and Company, 1931. xii+162 pp. $2.00.

We must first thank Mr. Spearman for avoiding the solemnity from which all too many American educational books suffer. He confesses that his attitude is one of cold-blooded investigation, a policy which he realizes is sure to get him more kicks than ha'pence. The first four chapters are pretty tightly packed psychology. To describe the creative process as he sees it, he has invented a new word, "noegenesis," combining the attaining of belief on adequate grounds and the generating of new mental content. In his judgment, creation and insight, generally taken to be opposite poles, are in truth absolutely coincident. At another point, he describes the process as that of "educing correlates." From this point of view, he then discusses first the pictorial and then the other arts. There follows an admirable chapter on scientific invention and discovery, and two chapters of interesting, but to the reviewer somewhat irrelevant, material on behavior and unreality, and then a final chapter on the greatest creation of all—the conception of the universe as each one of us builds it up.

Perhaps it is asking too much for so brief a treatment, but there are certain matters about which the reviewer would like to hear more; for example, the enormous difference between the work of genius and ordinary creative work. Are we to assume that Mr. Spearman's formula would account equally well for an utterly unimportant job and for a masterpiece? Although at one place he protects himself by assuming that both consciousness and subconsciousness play their part in the work of creation, the book as a whole leaves the impression that in the act of creation, the artist thinks it out. No matter how complete his previous cerebral preparation, would not any creative artist tell us that whatever he is doing at the critical moment, he is not thinking? One is equally in doubt as to Mr. Spearman's treatment of emotional content, and takes leave to doubt that what impelled such men as El Greco, Blake, or Meryon could possibly be called make-believe emotion.

Mr. Spearman probably knows more about art than any artist knows about psychology, but one wonders whether his knowledge is sufficient for the task he has set himself, on finding the works of such relatively unimportant painters as Moore and Burne-Jones selected for analysis.

On the whole, the book is well worth reading, though thought-provoking rather than thought-satisfying.

F. P. KEPPEL

A New Social Frontier

THE EDUCATION OF THE WHOLE MAN, *by L. P. Jacks.* New York: Harper and Brothers, 1931. 155 pp. $1.75.

Jacks here gives us in twelve short essays a new conception of education as the key industry of civilization. This will be so when we

> expand our vision from the idea of education as an episodic process conducted by professional drudges, whose dull humming goes on inside the walls of a school or a college, into the idea of it as the great romance, the summary adventure of our age, the central concern of every citizen, life-long in its duration, universal in its scope, addressed throughout to the making of whole men, and having nothing less for its object than to convert the totality of knowl-

edge into human skill, and bring it to bear on the pursuit of excellence in every department of social activity. In this larger conception education becomes, as it now is for the best workers in that profession, a vocation for all that is deepest in philosophy, most daring in idealism, and most resolute in self-devotion.

Then we shall have substituted man-making for war-making and developed a sound social system distinguished by its "capacity to afford continuous employment to the heroic elements in human nature."

Pedagogues and other professional drudges who are bored because of the ordinary routine of drumming book-say and hearsay information into uninterested minds will find in this book a new inspiration. It presents a challenge to action on the new unsubdued social frontier. Those who accept the challenge and enlist in this greatest of all modern pioneering adventures will find ample scope for dynamic use of their creative imagination and again feel the thrill of battle in a cause that is worthy of their mettle.

C. R. Mann
American Council on Education

THE MEASUREMENT OF MAN, *by J. A. Harris; C. M. Jackson; D. G. Paterson; and R. E. Scammon.* Minneapolis, Minnesota: University of Minnesota Press, 1930. vii+215 pp. $2.50.

Herein are reprinted the four lectures before the Society of Sigma Xi at the University of Minnesota, all of which are addressed to the common aim of man's better understanding of himself. *The Measurement of Man in the Mass* is discussed by the late Professor J. A. Harris, botanist. It deals with the exposition of the statistics of such variates as the relations of the stature of husbands and wives, fertility of English wives, head measurements of newborn infants of various nationalities, and various correlation comparisons amongst physical measures of fairly large samplings. The gist of this portion of the book is an introduction to some elementary statistical procedures, obviously addressed to those untrained in this field.

Professor C. M. Jackson, of the Anatomy Department, discusses "Normal and Abnormal Human Types" in the next lecture. Some figures are presented showing racial and national "types," together with a brief mention of some of the endocrine abnormalities.

"Personality and Physique" is discussed by Professor D. G. Paterson, of the Psychology Department. Physiognomy, character analysis, phrenology, and similar superstitions are examined in detail. The fallacies in every such system are clearly pointed out. Thence body build and intelligence, temperature, and the like are considered, and on all counts the conclusion is reached that "little can be judged" as to an individual's possession of such "traits" from "the more obvious anthropometric measurements." To the reviewer, the contribution of Professor Paterson and that following by Mr. R. E. Scammon are the best of the four lectures.

Since the publication of this book, Paterson has expanded his lecture into a book, *Physique and Intellect.* This work should serve as a model for students of Elementary Statistics, and also it should set to rest the ghosts of Charlatanism: phrenology, numerology, palmistry, Blackfordism, and the other attempts to predict conduct from certain aspects of physique.

"The Measurement of the Body in Childhood," by Professor Scammon, sets forth graphically the results of much work in this field by the author. The essential similarity of prenatal to postnatal growth of the various parts and organs of the body in rate and amount are discussed, and the methods used in quantitative description and comparison are shown.

Naturally in the short compass of the lectures many important topics are scantily treated. The book will be of interest to those seeking for the first time a point of

view on the interrelations of various body measurements.

SAMUEL RENSHAW
Ohio State University

College Guide Books

WHICH COLLEGE? *by Rita S. Halle.* New York: Macmillan Company, 1930. xxii+305 pp. $2.50.

Under the headings, "Which College?" "How to Get There?" "The Junior College?" and "After College—What?" the author has presented points of view and facts which should be extremely useful to prospective college students, to parents of prospective college students, and to those engaged in educational guidance in secondary schools and colleges. The four chapters named make up approximately the first sixth of the book. The material in these chapters is thoroughly up to date and most students of educational guidance would consider the points of view with regard to college attendance, vocational guidance, and college direction as essentially sound.

The remainder of the book under the headings, "Colleges for Men," "Colleges for Women," "Coeducational Colleges," and "Colleges for Negroes," includes summaries of data concerning more than 375 different institutions. The facts presented usually include the character of the institution, whether public, private, denominational; the date of its founding; size of enrollment and of faculty, of endowment, of campus, of buildings, of library; admission requirements, opportunities for financial aid; special types of courses such as honor courses; and such other important requirements as military training.

The author bases this book on the need for a more serious attitude, additional guidance, and additional information on the part of thousands of American youth rushing in increasing numbers into colleges concerning which their parents for the most part know relatively little. An examination of the book gives the writer the impression that while admirably adapted to raise questions as to the bases of choice, the book alone will not do much to answer any of these questions. So many of the factors that should determine which college any particular boy or girl should attend are beyond the scope of such a brief summary as the book affords. Someone, possibly the author of the book, should write a manual to accompany it, telling how to use it and where to find supplementary sources of information about any particular institution and how to make a more fundamental and thoroughgoing type of investigation into the colleges and vocations under consideration.

FRANCIS F. BRADSHAW
University of North Carolina

THE AMERICAN COLLEGE GIRL, *by Ten American College Girls.* Boston: L. C. Page and Company, 1930. xvi+313 pp. $3.00.

The title is misleading and by implication unfair. The book is not about the American college girl but about ten women's colleges for the American girl. To confine the title, *The American College Girl*, to students of women's colleges, or to students in these ten colleges presented, seems ill advised. It is unfair to these institutions. In what respect is a student in any one of these particular colleges uniquely the American college girl? What of the undergraduate girl in the University of Chicago or in Oberlin, for instance?

The book is a sort of *vade mecum* for Bryn Mawr, Goucher, Mount Holyoke, Radcliffe, Rockford, Scripps, Simmons, Smith, Vassar, and Wellesley, and contains much interesting material about these institutions. It would be a far more excellent and valuable guide book were the material better organized and presented under

proper headings. It would then be readily usable. It is not possible for an expository essayist to describe artistically or interestingly the history, the organization, a description of campus, building programs, academic customs, traditions, extra-curricular activities, college ideals, and a picture of a college girl herself in a single literary form. These essays were selected from those submitted in prize competitions sponsored by the publishers. The points of view unfortunately are not uniform, each college being presented by a "girl" who is either an undergraduate, an alumna, or professor.

The book is definitely a reference book. College officers, as well as parents and students, will find it helpful in giving the history and academic standards of these ten colleges. It does not portray the college girl, however, any more than a picture of her home and its activities portrays her. The book cannot be recommended as a sole criterion of judgment and is certainly no substitute for the fine literature which these institutions publish to set forth their own work and worth. We need a blue-book of women's colleges, a book carefully edited showing the work of all women's colleges, not of any ten. We need also a study of the American college girl. Does not one of the real values of *The American College Girl* lie in the fact that it reveals these needs?

THYRSA W. AMOS
University of Pittsburgh

An Unusual Book

WORLD WORKERS' EDUCATIONAL MOVEMENTS: THEIR SOCIAL SIGNIFICANCE, *by Marius Hansome.* New York: Columbia University Press, 1931. 594 pp. $5.00.

Mr. Hansome has put educators under obligation by assembling in a discriminating manner the more important facts, motives, and philosophies of the workers' educational movements as found predominantly in America and the European countries, and to a lesser extent in New Zealand, Japan, India, and Palestine. Scope and treatment place this work ahead of any treatise on workers' educational efforts so far published and known to the reviewer. The author's familiarity and first-hand experience with various types of labor education, particularly in England, Germany, Austria, and the Scandinavian countries, and his sympathetic grasp of their underlying philosophies considerably enhance the scholarly values of the study.

Though difficult to delimit at its periphery, workers' education is nevertheless distinct from other forms of adult education in that it is primarily intended to serve the special educational needs of labor unions, labor political parties, and co-operative movements. Its profusion of forms, materials, institutions, and objectives, often overlapping with similar features of what is generally referred to as adult education, forces the author to define workers' education loosely as that form of education intended for and maintained by the working classes.

It is precisely at its specific core of meaning as the hope, inspiration, instrument, and accomplishment of organized working groups toward the realization of their world view, however, that the workers' educational movement constitutes a challenge to the general educator. Where formulated, its ideology is precise, purposeful, and limited to the world of thought and action of the working classes; it is directed toward the transformation of the existing social order into what might be designated as the socialistic state. Its sources lie in a profound distrust in public education; its intent is to substitute for what is conceived of as biased education of the schools the unbiased instruction of the labor school and college; its objectives are the instrumental use of education for the betterment of social living; and its ma-

chinery, built by voluntary effort and frequently manned by leaders of intellectual capacity and repute, is maintained at a heavy sacrifice. In Europe, the sphere of its influence is steadily enlarging; in the United States, it does not as yet seem to have attained the same significance.

The author's capacity for critical analysis, sociological interpretation, philosophic grasp of issues, and careful scholarship make this comprehensive study a valuable addition to critical educational literature.

HENRY J. JEDDELOH
Ohio University

Educational Criticisms

THE AMERICAN ROAD TO CULTURE: A SOCIAL INTERPRETATION OF EDUCATION IN THE UNITED STATES, *by George S. Counts*. New York: John Day Company, 1930. xiii+194 pp. $2.50.

The reader who looks to find in this book a clear indication of the way by which America may achieve culture is apt to be disappointed. The writer seems to assert that the way is not through the school, but is the school itself. Though this term is made to include the university and the professional school, no room is found for the contributions of art, music, literature, and drama. Surely the road to culture must at least skirt these shores.

The reader may find a greater grievance in the fact that, while Mr. Counts deals critically with many aspects of American education, he does not always make his criticism constructive. He rightly stresses the American faith in the school, but he does not discuss its quality, and at times seems to doubt whether it is always rational, whether it is to lead to a vista of a larger life, or provide an easy avenue to security and comfort. He points defects in organization, but suggests no means of bringing an ampler and more enlightened public opinion to bear upon the problem, nor does he reveal any plan for the better co-ordination of local interest and informed oversight.

The author shows the weaknesses of a system based on assumed individual needs and the evils of a freely operating competitive spirit in education, but enunciates no principle of reform, the need of which, as he sees, increases as the opportunities for individual progress lessen. He sees the herd instinct rising in the inculcation of a common form patriotism and in the tendency to social conformity, but is content to leave unsaid his message of the real significance of personal worth. Finally, in a book which gave promise, by its title, of direction, he leaves us in a land pitted with the shell holes of a new industrialism, without a map, without a compass, and commends an attitude of philosophic doubt. The book is no doubt timely and serviceable, but is it all Mr. Counts has to give?

A. E. TWENTYMAN, *Chairman,*
World Association for Adult Education

A Timely Source-Study

THE EDUCATIONAL WORK OF THOMAS JEFFERSON, *by Roy J. Honeywell.* Cambridge, Massachusetts: Harvard University Press, 1931. xvii+295 pp. $3.00.

It is high time that someone made a really careful examination of Thomas Jefferson's writings on education. This rather closely packed, but interesting little source-study is evidence that Mr. Honeywell has fulfilled our hopes. With thoughtful comment and accurate appraisal, he allows the sage of Monticello to express himself on all phases of primary, secondary, and higher education. At the close of the treatise, he indicates the sources of Jefferson's ideas on these various matters. The book is supplied with generous documentary appendixes and a very useful bibliography.

ROBERT FRANCIS SEYBOLT
University of Illinois

In the Lay Magazines

"This Coming Era of Leisure," by Floyd H. Allport, *Harpers*, November, 1931.

A doubter who sees the tediousness of "technological leisure" but not an ennobling leisure questions how great gaps of time, released through modern business methods, are to be spent. "Technological leisure" is the condition which will exist when "a few hours (or perhaps minutes) per day given over to the running of machines ought to satisfy all biological needs; and the rest of our time will be our own." Will we goad ourselves to the stage where we are too tired for any but trivial pursuits?

The modern business and scientific methods which make possible the existence of technological leisure are making the spending of leisure time in contact with either nature or man growingly impossible. Mr. Allport charges that education is turning increasingly toward the vocational. Spoon feeding may produce "a race of morons well fitted to enjoy the age of the perfect labor-saving machine."

In spite of the cocksureness of most of our industrial leaders, I do not believe that they have even begun to face the problem intelligently. Their threadbare slogan, "training for leisure time," shows that they still regard the matter merely as the filling in of an idle period. The notion that, by the aid of night classes and adult extension courses, they can, from their present perspective, train workers for this unknown leisure is purely gratuitous. Having put vacant time into life, they imagine that they can put life back into the vacancy they have created. But it will not be a question merely of finding new occupations to fill the free spaces in life as we now know it.

"The Impending Radio War," by James Rorty, *Harpers*, November, 1931.

For those who are interested in the fate of the Fess Bill, when, or if, it reaches senate consideration this fall, Mr. Rorty has given a very complete description of the scene upon which the battle between educational and commercial broadcasters will be waged. Control of radio means, increasingly, control of public opinion, is this writer's belief, and the solution of this phase of the public-service problem will be highly significant in the entire movement for public operation of essential devices and utilities.

The number of educational broadcasters is but a pitiful fragment of the early valiant band who entered the radio field. The militant wing of educators has organized as the National Committee on Education by Radio, a body representing the National Education Association, the National Council of State Superintendents, the Association of College and University Broadcasting Stations, the National University Extension Association, the National Catholic Educational Association, the American Council on Education, the Jesuit Education Association, and the Association of Land-Grant Colleges and Universities. Joy Elmer Morgan, editor of the *Journal of the National Education Association*, is chairman of the committee which is operating under a five-year grant from the Payne Fund.

Other educators who "have accepted the existing organization of broadcasting to the extent at least of working with it and through it" are represented by the National Advisory Council on Radio in Education, jointly financed by John D. Rockefeller, Jr., and the Carnegie Corporation. Its president is Mr. Robert A. Millikan.

The educational militants charge that this organization is merely a smoke screen for the commercial broadcasters, although the National Council has taken no position regarding the Fess Bill, and in fact officially abstains from legislative activity.

We conclude that the author agrees with Graham Spry when he quotes the address of Mr. Spry, president of the Canadian Radio League, at the Second Institute for Education by Radio: " 'Commercial in-

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terests . . . cannot be chastened. They must be subdued.' "

"American Students and French Novels," by André Maurois, *Yale Review*, Autumn, 1931.

The author of *Disraeli* here recounts his impressions of American students gained from experiences in giving a course in French literature to a group of men in an American university last winter.

As I talk with them I sum up my impressions. Are they intelligent? Yes, very. What of their literary culture? About the same as that of a European of the same age; possibly they have read more widely. But they are almost completely lacking in historical culture, and especially . . . they have no idea of what the construction or the design of a book can be. This indifference to the logical sequence of thought is an Anglo-Saxon trait. I find it even stronger in these Americans than in the English. But all this is compensated for by youth, the freshness of their look, the novelty of their words and usage. It is a comedy of nascent poetry, the country of renascence. The classical age will come later on.

"Technical Education in the Soviet Union," by S. P. Tambovtsev, *Economic Review of the Soviet Union*, Vol. VI, No. 19.

A member of the Technical Education Section of the Supreme Economic Council of the United States of Soviet Russia has prepared this article, based on his report submitted to the Society for the Promotion of Engineering Education.

Compulsory primary education was established universally in Russia last year. In factory centers and in collective-farm districts there are seven-year schools. Where individual farming still exists, four-year primary schools, with a sort of extension work in supplement, are maintained. After any of these schools, the next unit is the technicum, where a three-year course prepares low-grade technicians and specialists. The student must work three years before

he can be admitted to the university. There, a three- to four-year course will complete his engineering training. Two- and three-year courses for factory apprentices who want to become skilled workers also exists.

In 1914–15 there were twelve higher technical schools and 19,148 students; in 1920–21 there were thirty-five schools and 31,729 pupils; and in 1928–30, thirty schools with an enrollment of 61,120.

"Northwestern University," by William A. Dyche, *Review of Reviews*, October, 1931.

The advantages of the separation at Northwestern of its academic and professional schools, with the advantages of seclusion in residential Evanston for the undergraduate division and Chicago contacts on the McKinlock Memorial Campus for the specialized schools, are outlined in Mr. Dyche's article.

Fifty-three contacts are maintained with outside institutions, largely public-welfare organizations. Two theological institutions are maintained by churches. There are many privately endowed hospitals. Foundations for economic research and the legal clinic are other arresting pictures shown in this brief but suggestive review.

"Books of One's Own," by A. Edward Newton, *Atlantic Monthly*, October, 1931.

Swarthmore should make a deep bow. College press agents should prick up their ears and find a new channel for arresting but dignified ballyhoo.

In the guise of a discussion of rare books and an arraignment of pseudolearning, this bibliophile praises the Swarthmore scheme of awarding a prize to the student who, during his college term, has built up the best personal library. Incidentally, the prize, endangered by the death of the original founder, is now being perpetuated through a gift from Mr. Newton.

FRANCES KIRKPATRICK

RADIO AND EDUCATION, 1931

Edited by
LEVERING TYSON

What radio can do for education—and education for radio—is told by those who know: RAY LYMAN WILBUR, ROBERT A. MILLIKAN, W. C. BAGLEY, BENJAMIN H. DARROW, BELLE SHERWIN, WALTER DAMROSCH, HENRY A. BELLOWS, SIR JOHN C. W. REITH, and others. This volume records the complete proceedings of the first annual assembly of the National Advisory Council on Radio in Education.

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Vol. III. Proceedings of the Institute for Administrative Officers of Higher Institutions, 1931.

Edited by
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